FINAL

Confirmation Sampling and Analysis Report for Installation Restoration Program Site FC-2



Kelly Air Force Base
Texas

Prepared For

Air Force Center for Environmental Excellence
Brooks Air Force Base, Texas

and

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Texas

March 1999

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FINAL

CONFIRMATION SAMPLING AND ANALYSIS REPORT FOR INSTALLATION RESTORATION PROGRAM SITE FC-2

KELLY AIR FORCE BASE, TEXAS

Prepared for:

Air Force Center for Environmental Excellence
Brooks AFB, Texas

and

SA-ALC/EMRO
Kelly Air Force Base, Texas

Contract F41624-92-8036, Delivery Order 17

March 1999

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TABLE OF CONTENTS

Page

ACRONYMS AND ABBREVIATIONS iii

SECTION 1 - INTRODUCTION 1-1

1.1 Purpose 1-1
1.2 Site and Project Background 1-1
1.2.1 Site Description and Background 1-1
1.2.2 Project Background 1-3
1.3 Summary of Confirmation Sampling Results 1-5
1.4 Report Organization 1-5

SECTION 2 - SITE CONFIRMATION SAMPLING AND ANALYSIS ACTIVITIES 2-1

2.1 Soil Sampling Procedures 2-1
2.1.1 Borehole Locations and Sampling Depths 2-1
2.1.2 Drilling, Sampling, and Equipment Decontamination 2-1
2.1.3 Field and Laboratory Data Quality Assurance/Quality Control 2-4
2.1.4 Soil Analyses 2-4
2.2 Groundwater Sampling Procedures 2-4
2.2.1 Well Purging 2-4
2.2.2 Sample Extraction, Handling, and Analysis 2-5
2.2.3 Onsite Chemical Parameter Measurement 2-5
2.2.4 Equipment Decontamination 2-5

SECTION 3 - CONFIRMATION SAMPLING RESULTS 3-1

3.1 Laboratory Soil Results 3-1
3.1.1 Total Petroleum Hydrocarbons 3-1
3.1.2 BTEX and Other Volatile Organic Compounds 3-4
3.1.3 Semivolatile Organic Compounds 3-4
3.1.4 Metals 3-4
3.1.5 Soil Data Summary and Bioventing System Effectiveness 3-9
3.2 Soil Cleanup Levels 3-9
3.2.1 Land Use and Potential Receptors 3-10
3.2.2 Comparison to Risk Reduction Standard 2 Levels 3-10
3.3 Laboratory Groundwater Results 3-11

TABLE OF CONTENTS (Continued)

		Page
3.4	Natural Attenuation in Groundwater	3-11
SECTION 4 - CONCLUSIONS AND RECOMMENDATIONS		4-1
4.1	Conclusions	4-1
4.2	Recommendations	4-1
SECTION 5 - REFERENCES		5-1

Appendix A - Confirmation Sampling and Analysis Plan
Appendix B - Boring Logs and Groundwater Sampling Forms
Appendix C - Laboratory Analytical Results

LIST OF TABLES

No.	Title	Page
3.1	Total Petroleum Hydrocarbons in Soil	3-2
3.2	Volatile Organic Compounds Detected in Soil	3-5
3.3	Semivolatile Organic Compounds Detected in Soil	3-5
3.4	Metals in Soil	3-8
3.5	Volatile Organic Compounds and Geochemical Indicators in Groundwater	3-12

LIST OF FIGURES

No.	Title	Page
1.1	Site Layout	1-2
2.1	Confirmation Soil Borehole and Groundwater Sampling Locations	2-2
3.1	TPH in Soil	3-3
3.2	VOCs and SVOCs in Soil	3-6

ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
µg/L	Microgram per liter
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, xylenes
DOT	Department of Transportation
EMRO	Environmental Management Office
ES	Engineering-Science, Inc.
FS	Feasibility study
ID	Inside diameter
IRP	Installation Restoration Program
IWTP	Industrial waste treatment plant
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
MP	Monitoring point
MSC	Medium-specific concentration
mV	Millivolts
NFRAP	No further response action planned
OU	Operable unit
Parsons ES	Parsons Engineering Science, Inc.
POL	Petroleum, oils, and lubricants
QA	Quality assurance
QC	Quality control
Redox	Reduction/oxidation potential
RRS 2	Risk Reduction Standard 2
SA-ALC	San Antonio Air Logistics Center
SAP	Sampling and analysis plan
SVOC	Semivolatile organic compound
TAC	Texas Administrative Code
TNRCC	Texas Natural Resources Conservation Commission
TPH	Total petroleum hydrocarbons
TPH-d	Total petroleum hydrocarbons as diesel
TPH-g	Total petroleum hydrocarbons as gasoline
UCL	Upper confidence limit
USEPA	US Environmental Protection Agency
VOC	Volatile organic compound
VW	Vent well

SECTION 1

INTRODUCTION

1.1 PURPOSE

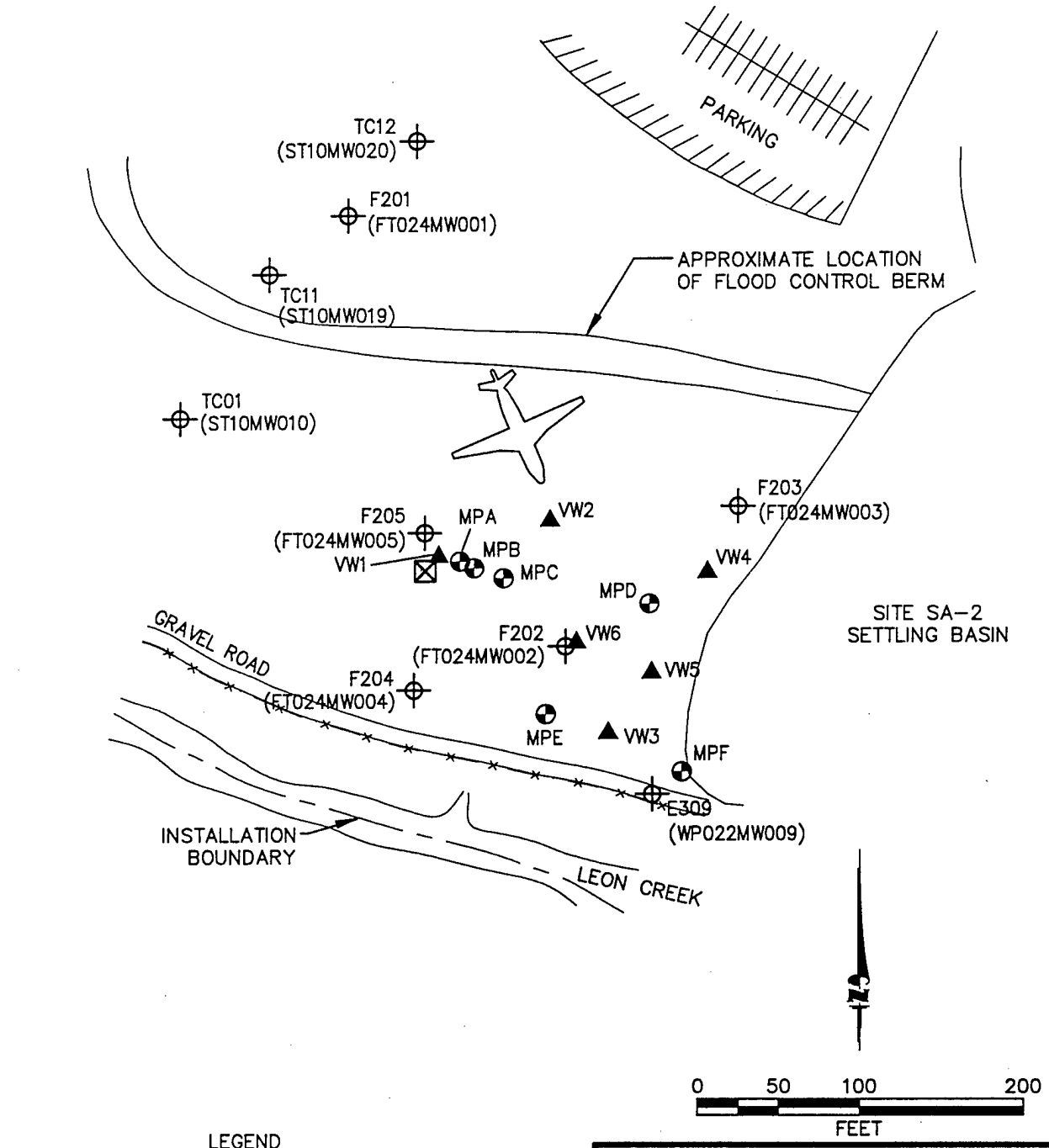
This confirmation sampling and analysis report for Installation Restoration Program (IRP) Site FC-2, at Kelly Air Force Base (AFB), Texas has been prepared by Parsons Engineering Science, Inc. (Parsons ES) for submittal to the Texas Natural Resource Conservation Commission (TNRCC); the US Air Force Center for Environmental Excellence (AFCEE), Brooks AFB, Texas; and San Antonio - Air Logistics Center, Environmental Management Office (SA-ALC/EMRO), Kelly AFB, Texas. This report has been prepared as part of the AFCEE Extended Bioventing Project (Contract F41624-92-8036, Delivery Order 17). The purpose of this report is to document the effectiveness of soil remediation at Site FC-2 and to provide data to support an eventual no-further-response-action-planned (NFRAP) decision for vadose zone soils at the site.

1.2 SITE AND PROJECT BACKGROUND

1.2.1 Site Description and Background

Site FC-2 is located in Zone 2, a 164-acre area in the southern portion of Kelly Air Force Base. The site is situated approximately 1,100 feet south of Military Highway and approximately 200 feet north of Leon Creek. Site FC-2 consists of a circular area, approximately 150 feet in diameter, where fire control training exercises were conducted near a simulated airplane fuselage, and includes the downgradient area which extends southeast toward Leon Creek (Figure 1.1). During fire control training exercises which were performed two to four times per year from the 1950's until 1981, waste petroleum, oils, and lubricants (POLs) were poured on the ground and ignited near the simulated airplane and then were extinguished with a water/protein mixture or aqueous, film-forming foam. No collection facility or oil/water separator was used to stop direct infiltration of waste POLs into the ground.

Site FC-2 represents one of 16 individual IRP sites within Zone 2. The 16 sites are addressed collectively as Zone 2 because of their proximity to one another and the need to optimize soil and groundwater remediation in the entire area. The main sources of soil and groundwater contamination within Zone 2 include historic waste disposal through fire control training, chemical waste disposal in evaporation pits, and sludge drying in land spreading areas. Soils at 12 of the 16 sites (including FC-2) are contaminated with organic constituents at concentrations exceeding the preliminary remediation goals established in the feasibility study (FS) for Zone 2 soils (Halliburton



LEGEND

F204 (FT024MW004) — EXISTING MONITORING WELL (IRPIMS WELL NUMBER SHOWN IN PARENTHESES)

MPA — VAPOR MONITORING POINT

VW1 — AIR INJECTION VENT WELL

EXPANDED-SCALE BLOWER UNIT

CHAIN LINK FENCE

FIGURE 1.1

SITE LAYOUT

Site FC-2
Kelly AFB, Texas

PARSONS ENGINEERING SCIENCE, INC.

Denver, Colorado

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NUS, 1997). Based on this contamination, these 12 sites have been grouped together into Soil Operable Unit 3 (OU3). Other OU3 sites in the area of Site FC-2 include the jet engine test cell complex (Site S-9) located approximately 700 feet to the north, the industrial waste treatment plant (Site IWTP) located approximately 1,000 feet to the east, and the industrial waste sludge spreading area (Site SA-2) located approximately 150 feet southeast of the simulated airplane. Also, the southeastern quarter of IRP Site FC-2 has been included in Soil OU4 because of inorganic constituent (metals) concentrations in soil that exceed acceptable risk levels (Halliburton NUS, 1997). Groundwater in Zone 2 is managed and regulated as a separate OU, independent of Zone 2 soils.

Previous investigations conducted at Site FC-2 have identified fuel hydrocarbons including benzene, toluene, ethylbenzene, and xylenes (BTEX), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals in soils and groundwater. Investigation results indicated that petroleum hydrocarbon contamination in soils at the site was most significant above the water table in the capillary fringe (smear-zone) southeast of the simulated airplane toward Leon Creek (near monitoring well F202).

Groundwater interim actions have been implemented within Zone 2 to actively prevent or minimize release of contaminated groundwater into Leon Creek. These actions include a combined pump-and-treat system with extraction wells at Site IWTP and three other IRP sites within Zone 2. Groundwater is extracted at each of these locations and treated using ultraviolet oxidation.

1.2.2 Project Background

Since 1992, Kelly AFB has participated in two AFCEE-sponsored bioventing projects: currently the Extended Bioventing Project, and formerly the Bioventing Pilot Test Initiative. The Bioventing Pilot Test Initiative included conducting more than 135 *in situ* bioventing pilot tests at 48 Air Force installations nationwide. These tests were designed to collect data on the effectiveness of bioventing for the remediation of soil contaminated with fuel hydrocarbons (e.g., JP-4 jet fuel, diesel fuel, gasoline, or heating oil). Site FC-2 was selected for inclusion in the Bioventing Pilot Test Initiative. The initial bioventing pilot testing effort at FC-2 consisted of installing one bioventing air injection vent well (VW1) and three soil vapor monitoring points (MPA, MPB, and MPC); collecting initial soil and soil gas samples; performing initial *in situ* respiration tests and fuel biodegradation measurements; air permeability testing; installing a pilot-scale bioventing system; and operating the installed system for 1 year. Complete bioventing pilot testing results are presented in the *Draft Interim Pilot Test Results Report for Site S4 and Site FC-2* (Engineering-Science, Inc. [ES], 1993).

AFCEE sponsored the Extended Bioventing Project to initiate, continue, or expand bioventing system operation and provide a means for confirmation or closure soil sampling when system monitoring results indicated sufficient remediation of petroleum-contaminated soils. To attain these objectives, four options (Options 1 through 4) were established. In September 1994, based on the results of the Pilot Test Initiative, Site

FC-2 was funded for system expansion (Option 4) and 1 year of extended bioventing system operation, followed by soil gas sampling and *in situ* respiration testing (Option 1). In anticipation that expanded bioventing system operation would sufficiently remediate petroleum-contaminated soils, Site FC-2 also was funded for confirmation/closure soil sampling (Option 2).

In January 1996, the bioventing system was expanded to include 5 additional VWs (VW2 to VW6) and three additional MPs (MPD, MPE, and MPF) (Figure 1.1). Following system installation and optimization, Option 1 maintenance and monitoring began. In February 1997, after a 1-month system shutdown period, soil gas samples were collected and analyzed, and respiration tests were conducted (Parsons ES, 1997). Based on the year-end respiration test and soil gas sampling results, significant remediation of vadose zone soils had occurred. Soil gas results indicated that BTEX (the most mobile and toxic fuel components) concentrations in soil had been reduced considerably during the first year of expanded-scale bioventing system operation. However, Option 1 results also indicated that aerobically biodegradable fuel components were still present in vadose zone soils resulting in anoxic conditions when the bioventing system was shutdown (Parsons ES, 1997). Therefore, the bioventing system was restarted and allowed to operate for an additional 16 months to further treat site soils prior to confirmation sampling.

Based on the indicated BTEX reductions in site soil, AFCEE authorized initiation of confirmation soil sampling activities to document the effectiveness of soil remediation at the site and to support an eventual NFRAP decision. In preparation for the confirmation soil sampling, a sampling and analysis plan (SAP) was prepared by Parsons ES (1998). At the request of AFCEE and Kelly AFB, limited groundwater sampling for dissolved contaminants and various geochemical indicators also was incorporated into the SAP. A copy of the SAP is provided as Appendix A of this report.

Following TNRCC, AFCEE, and Kelly AFB approval of the SAP, the US Environmental Protection Agency (USEPA, 1998) reviewed the SAP and requested the addition of metals analyses for site soils. Although air injection bioventing is not effective in treating inorganic soil contamination, AFCEE (1998) approved the collection of surface soil samples for metals analyses to provide further site characterization data.

Confirmation soil and groundwater sampling was conducted at Site FC-2 from 8 through 12 June 1998. Confirmation soil sampling activities consisted of advancing 11 boreholes to depths ranging from 15 to 21 feet below ground surface (bgs), and analyzing selected soil samples for total petroleum hydrocarbons (TPH), VOCs, SVOCs, and metals. A total of 20 soil samples and associated quality control samples were submitted for analysis. The confirmation sampling targeted unsaturated soils in the vicinity of the fire control training area, as well as impacted smear-zone soils downgradient from the site. Groundwater sampling included collecting groundwater samples from six monitoring wells and analyzing the samples for VOCs. In addition, groundwater samples from these wells were analyzed onsite for various geochemical

parameters to evaluate the potential for biodegradation (i.e., natural attenuation) of dissolved petroleum hydrocarbons.

1.3 SUMMARY OF CONFIRMATION SAMPLING RESULTS

The analytical results from the confirmation soil sampling event were compared to default TNRCC (1998b) Risk Reduction Standard 2 (RRS 2) medium-specific concentrations (MSCs) for residential soils, as defined by 30 Texas Administrative Code (TAC) 335, Subchapter S, §335.559. Soil data exceeded the RRS 2 MSC for residential use based on groundwater protection (GWP-Res) for one VOC (chlorobenzene), two SVOCs (benzo[a]anthracene and bis[2-ethylhexyl]phthalate), and several metals. Because some RRS 2 levels are exceeded, site closure, without further site remediation, will need to be pursued under criteria specified for Risk Reduction Standard 3 (§335.561). Closure under RRS 3 requires development and attainment of site-specific criteria based on risk assessment, and requires post-closure care and/or institutional controls. Determination of criteria appropriate for attainment of closure under RRS 3 was beyond the scope of this project.

1.4 REPORT ORGANIZATION

This site confirmation sampling and analysis report consists of five sections, including this introduction, and three appendices. Section 2 is a description of the soil and groundwater sampling activities conducted at the site. Section 3 summarizes sampling analytical results and compares the results to selected comparison criteria. In addition, a brief summary of natural attenuation indication parameters are provided. Section 4 presents conclusions and recommendations, and Section 5 lists the references that were used in preparation of this report. Appendix A presents a copy of the SAP for Site FC-2, which includes a detailed site description and summary of previous site investigations. Appendix B provides copies of site borehole logs and completed groundwater sampling forms. Appendix C presents laboratory analytical data for site environmental and quality assurance/quality control (QA/QC) samples.

SECTION 2

SITE CONFIRMATION SAMPLING AND ANALYSIS ACTIVITIES

The purpose of this section is to summarize site confirmation soil and groundwater sampling activities, including sampling locations and sampling depths, sampling procedures, analytical methods used, and QA/QC procedures followed. These methods/procedures are described in more detail in the SAP for Site FC-2 (see Appendix A). The SAP was implemented by qualified Parsons ES scientists trained in conducting soil and groundwater sampling, records documentation, and chain-of-custody procedures. Specialized Assays, Inc., a State of Texas-certified laboratory, performed the environmental sample analyses.

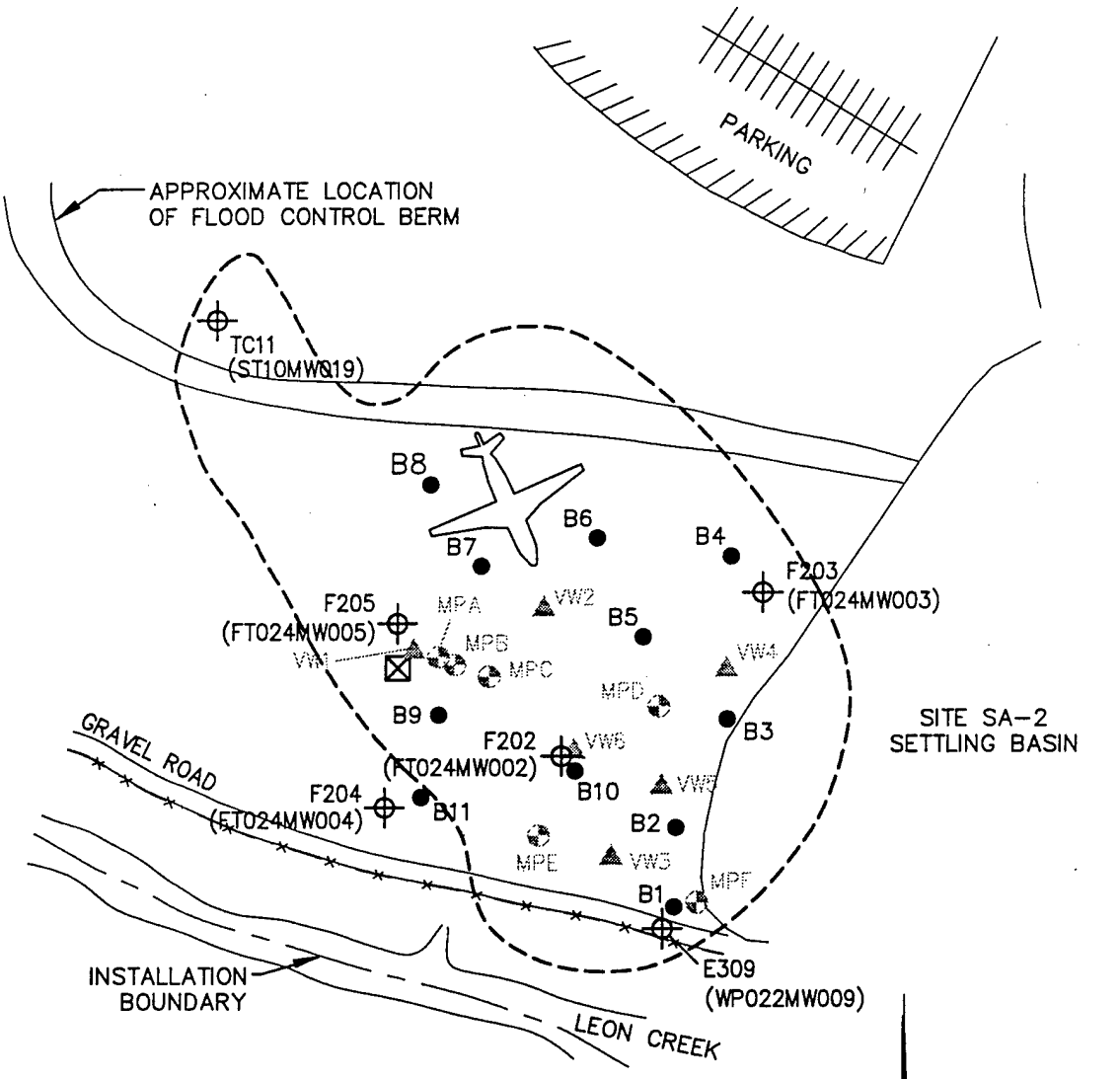
2.1 SOIL SAMPLING PROCEDURES

2.1.1 Borehole Locations and Sampling Depths

One month prior to soil sampling, the expanded-scale bioventing system at Site FC-2 was shut down to allow the subsurface to return to equilibrium conditions. Confirmation soil sampling was conducted at the site on 10 and 12 June 1998. Eleven boreholes (B1 through B11) were advanced and sampled in the vicinity of the simulated airplane and downgradient toward Leon Creek. Figure 2.1 shows the locations of the confirmation soil sampling boreholes and the approximate pre-bioventing area where TPH soil concentrations exceeded 1,000 milligrams per kilogram (mg/kg). Samples for geologic logging, field screening, and possible chemical analysis generally were collected at 5-foot intervals from the ground surface to the total depth of each boring, which ranged from 15 to 21 feet bgs. To provide complete documentation of the sampling event, detailed records were maintained by the Parsons ES field hydrogeologist.

2.1.2 Drilling, Sampling, and Equipment Decontamination

Boreholes were advanced using a drill rig equipped with 4.25-inch inside-diameter (ID) hollow-stem augers. Prior to drilling, the drill rig and other downhole equipment and sampling tools were decontaminated as described in the SAP (Appendix A). Cleaning was accomplished using a high-pressure, hot-water wash, followed by a potable water rinse at the Kelly AFB facility for large equipment decontamination. Drill cuttings were placed in 55-gallon Department of Transportation (DOT)-approved drums and turned over to Kelly AFB. Boreholes were abandoned with a bentonite/cement grout mixture that contained a maximum of 5 percent bentonite.



NOTE:

ONLY THOSE MONITORING WELLS SHOWN WERE SAMPLED DURING THE JUNE 1998 CONFIRMATION SAMPLING EVENT.

LEGEND

B7 ● 1998 SOIL BOREHOLE LOCATION

1992 ESTIMATED AREA EXCEEDING 1,000 mg/kg TPH IN SOIL (PARSONS ES, 1998)

F204 (FT024MW004) ⊕ MONITORING WELL (IRPIMS WELL NUMBER SHOWN IN PARENTHESES)

FIGURE 2.1

CONFIRMATION SOIL BOREHOLE AND GROUNDWATER SAMPLING LOCATIONS

Site FC-2
Kelly AFB, Texas

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Denver, Colorado

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Where boreholes penetrated the groundwater surface, bentonite chips were placed in the borehole to a level above the saturated zone.

Boreholes were drilled to 0.3 and 3.5 feet below the groundwater table surface; total borehole depths were between 15 and 21 feet bgs. Relatively undisturbed soil samples, suitable for chemical analysis, were collected from soil borings using a standard split-barrel sampler lowered through the hollow stem of the augers and driven approximately 1.5 feet into undisturbed soil, ahead of the augers. Soil types were described in accordance with the standard Parsons ES soil description format. All soil samples were examined for evidence of hydrocarbon contamination. Soil samples selected for laboratory analysis were transferred into glass jars with Teflon®-lined lids. Care was taken to minimize disturbance of the samples. Between sampling events, the split-barrel sampler was cleaned with Alconox® detergent, followed by successive potable and distilled water rinses. Decontamination fluids generated at the drill site were placed in drums and transported to the OPTEC Environmental Process Control Facility (the former Kelly AFB IWTP) for disposal.

A total of 23 soil samples, including three sample replicates, were collected at Site FC-2 and submitted for laboratory analysis. Of these, 16 soil samples were collected for laboratory analysis of VOCs, SVOCs, and TPH and seven samples collected from shallow soils (1 to 3 feet bgs) were analyzed for total metals.

Soil borehole locations were selected to assess petroleum hydrocarbon contamination in vadose zone soils in the vicinity of the former fire control training area (simulated airplane), and to address petroleum hydrocarbon contamination in the smear zone (groundwater/soil interface) downgradient from the former training area. Soil samples for laboratory analysis of TPH, VOCs, and SVOCs were selected from the most contaminated sample intervals based on field observations and measurements. Two samples from each of the three soil boreholes near the simulated airplane (B6, B7, and B8) were submitted for laboratory analysis. For the eight soil boreholes downgradient of the training area, field evaluation confirmed that the most contaminated soil interval generally occurred just above the water table in the capillary fringe. For these boreholes, one soil sample from each borehole was submitted for laboratory analysis.

Samples collected for metal analysis were collected from three soil boreholes closest to the simulated airplane (B6, B7, and B8) and three boreholes southeast of this location (B2, B5, and B10). Because of the relative immobility of metals, samples for inorganic analysis were collected in shallow soils 1 to 3 feet bgs.

Soil samples selected for laboratory analysis were labeled with the site name and borehole number, sample depth, date of collection, and other pertinent data. Sample containers were then packaged to prevent breakage and were placed in an insulated shipping container packed with ice. Samples for laboratory analysis were shipped under standard chain-of-custody procedures to Specialized Assays, Inc. in Nashville, Tennessee.

2.1.3 Field and Laboratory Data Quality Assurance/Quality Control

Samples were collected, preserved, transported, and analyzed in such a manner that sampling results provide a reliable representation of the soil quality at the site. To meet this requirement, the procedures described in Section 4 of the SAP (Appendix A) were followed during sample collection, handling, and analysis. In addition, laboratory QC samples were prepared and analyzed.

Field QC samples collected included: two replicate soil samples for TPH, VOC, and SVOC analysis (14 percent); one replicate for total metals analysis (17 percent); one equipment rinseate that was analyzed for TPH, VOCs, and SVOCs; and two trip blanks that were analyzed for VOCs. No analytes were detected in the trip blanks or the equipment rinseate sample.

2.1.4 Soil Analyses

All samples were analyzed by Specialized Assays, Inc. a State of Texas-certified laboratory. Soil samples were analyzed by USEPA Method SW8260B for VOCs, by USEPA Method SW8270C for SVOCs, by USEPA Method SW7141 for mercury, by USEPA Method SW6010B for all other metals, and by USEPA Method SW8015B modified for diesel- and gasoline-range TPH.

2.2 GROUNDWATER SAMPLING PROCEDURES

During the confirmation sampling event, groundwater samples were collected from six existing groundwater monitoring wells for analysis. Groundwater samples were collected from wells F202 (FT024MW002), F203 (FT024MW003), F204 (FT024MW004), F205 (FT024MW005), E309 (WP022MW009), and TC11 (ST10MW019). The locations of the groundwater sampling wells are shown on Figure 2.1. Geochemical data relevant to documenting the potential for natural attenuation of dissolved petroleum hydrocarbons and evaluating environmental fate and transport also were measured. Groundwater samples were collected using the procedures described in the SAP (Appendix A). Investigation activities included water level measurements, well purging and sampling, and field and fixed-base (laboratory) analytical measurements.

2.2.1 Well Purging

Prior to removing any water from the well, the static water level was measured. A decontaminated water level probe was used to measure the depth to groundwater below the well datum (to the nearest 0.01 foot). After measuring the static water level, the water level probe was lowered slowly to the bottom of the well, and the total well depth was measured to the nearest 0.01 foot. Based on these measurements, the volume of water in the well casing was calculated, and a minimum of three times the calculated volume was removed from the well. A submersible Keck pump was used to purge groundwater from each well prior to sampling. The pH, temperature, specific conductivity, and reduction/oxidation (Redox) potential were monitored before, during, and after well purging and recorded on well sampling forms. Following removal of at

least three casing volumes of water, well purging was continued until the pH, temperature, and specific conductivity stabilized to within 10 percent of previous readings. Purge water was collected in appropriate temporary storage containers and transported to the OPTEC Environmental Process Control Facility for disposal.

2.2.2 Sample Extraction, Handling, and Analysis

A peristaltic pump with dedicated, disposable tubing was used to extract groundwater samples from each well. The extraction equipment was lowered into the water gently to prevent splashing, and well water was extracted slowly to minimize volatilization of contaminants. Samples were transferred directly to the appropriate sample container. The water was carefully poured down the inner walls of the sample bottle to minimize aeration of the sample. Sample containers were filled so that no air space remained in the container.

Sample containers were provided by the laboratory. The sample containers were filled as described in SAP and the container lids were tightly closed. The sample bottles were labeled with the site name and well number, sample depth, date of collection, project name, and other pertinent data. Samples were properly prepared for transport to the laboratory by placing the samples in a cooler containing ice to maintain a shipping temperature of approximately 4 degrees Celsius (°C). Chain-of-custody records were prepared in the field and accompanied the samples to the analytical laboratory.

Groundwater samples for laboratory analysis were collected at six wells. All groundwater samples were sent to Specialized Assays, Inc. in Nashville, Tennessee. All samples were analyzed for VOCs by USEPA Method SW8260B and for sulfate by USEPA Method SW9056. In addition, two samples were analyzed for methane by USEPA Method SW8015M. QA/QC samples also were collected and analyzed in accordance with Section 4 of the SAP (Appendix A). One duplicate groundwater sample (17 percent), one equipment blank, and one trip blank were submitted and analyzed for VOCs. Triplicate volume was collected from one sample for matrix spike/matrix spike duplicate testing. No VOCs were detected in the trip blank.

2.2.3 Onsite Chemical Parameter Measurement

Many of the groundwater chemical parameters listed in Table 4.2 of the SAP (Appendix A) were measured onsite by Parsons ES personnel. Temperature, pH, specific conductivity, redox potential, and dissolved oxygen measurements were made using direct-reading meters, while others parameters were measured using a Hach® portable colorimeter in accordance with specific Hach® analytical procedures. These procedures are described in Section 4 of the SAP (Appendix A).

2.2.4 Equipment Decontamination

The submersible pump was decontaminated by submersion in an Alconox® wash and running the wash solution through the pump. The pump was then submersed in water containing approximately 5 percent isopropyl alcohol and the solution was run through

the pump. Finally the pump was submerged in distilled water and the distilled water was run through the pump. Because new, disposable tubing was used for sample extraction at each well, the tubing was not decontaminated before use. Decontamination fluids were placed in temporary storage containers and transported to the OPTEC Environmental Process Control Facility for disposal.

SECTION 3

CONFIRMATION SAMPLING RESULTS

This section summarizes the analytical results from the confirmation sampling activities. This section also compares soil data to State of Texas RRS 2 MSC values for residential soils based on groundwater protection. Although groundwater monitoring was performed in addition to confirmation soil sampling, a detailed evaluation of groundwater contamination and the effects of remediation was not performed. Groundwater sample results including geochemical indicators typical for evaluation of natural attenuation of dissolved petroleum hydrocarbon contaminants are presented.

Borehole logs and groundwater sampling forms from the confirmation sampling event are included in Appendix B, and complete soil analytical results from Specialized Assays Inc. are presented in Appendix C.

3.1 LABORATORY SOIL RESULTS

3.1.1 Total Petroleum Hydrocarbons

Confirmation sampling results for total petroleum hydrocarbons as diesel (TPH-d) and total petroleum hydrocarbons as gasoline (TPH-g) are presented in Table 3.1 and shown on Figure 3.1. Maximum detected concentrations of 88.2 and 310 mg/kg were observed for TPH-d and TPH-g, respectively. Soil concentrations of TPH-d exceeding 75 mg/kg were detected near the airplane in shallow soils (B6 at 3 feet bgs [B6-3] and B8-6) and also in the deeper smear zone soils at this location (B8-17). Soil concentrations of TPH-g exceeding 200 mg/kg were primarily detected in the deeper smear zone soils downgradient from the airplane (B2-15, B4-17.5, and B10-15.5). In shallower soils near the airplane (i.e., former training area), a TPH-g concentration of 159 mg/kg was detected at B6-3.

Confirmation sample results for TPH indicate that petroleum hydrocarbon concentrations in soils have been reduced significantly as compared to pre-bioventing concentrations presented in Table 2.3 of the SAP (Appendix A). Prior to initiating expanded-scale bioventing in January 1996, TPH concentrations as high as 2,391 mg/kg were measured in soils downgradient from the former fire training area. Reductions in TPH similar to those observed following 1 year of pilot-scale bioventing (i.e., 1 to 2 orders of magnitude) occurred as a result of approximately 2.5 years of expanded-scale bioventing targeted to treat the downgradient smear-zone soils.

TABLE 3.1
TOTAL PETROLEUM HYDROCARBONS IN SOIL
SITE FC-2
KELLY AFB, TEXAS

		Total Petroleum Hydrocarbons[a/]	
	Depth	Diesel Range	Gasoline Range
Sample	(feet bgs[b/])	(mg/kg[c/])	(mg/kg)
FC2-B1	13.5	3.26	<1.32[d/]
FC2-B2	15	16.4	218
FC2-B3	17.5	11	9.68
FC2-B4	17.5	8.84	309
FC2-B5	17	4	<1.3
FC2-B6	3	76.1	159
FC2-B6	19	2.5	<1.04
FC2-B7	17	3.19/11.9[e/]	<1.35/<1.3
FC2-B7	19	15.5	<1.19
FC2-B8	6	81.8	<1.15
FC2-B8	17	88.2	14.1
FC2-B9	15	3.17	<1.3
FC2-B10	15.5	16.7/16.7	306/310
FC2-B11	18.5	7.55	<1.12

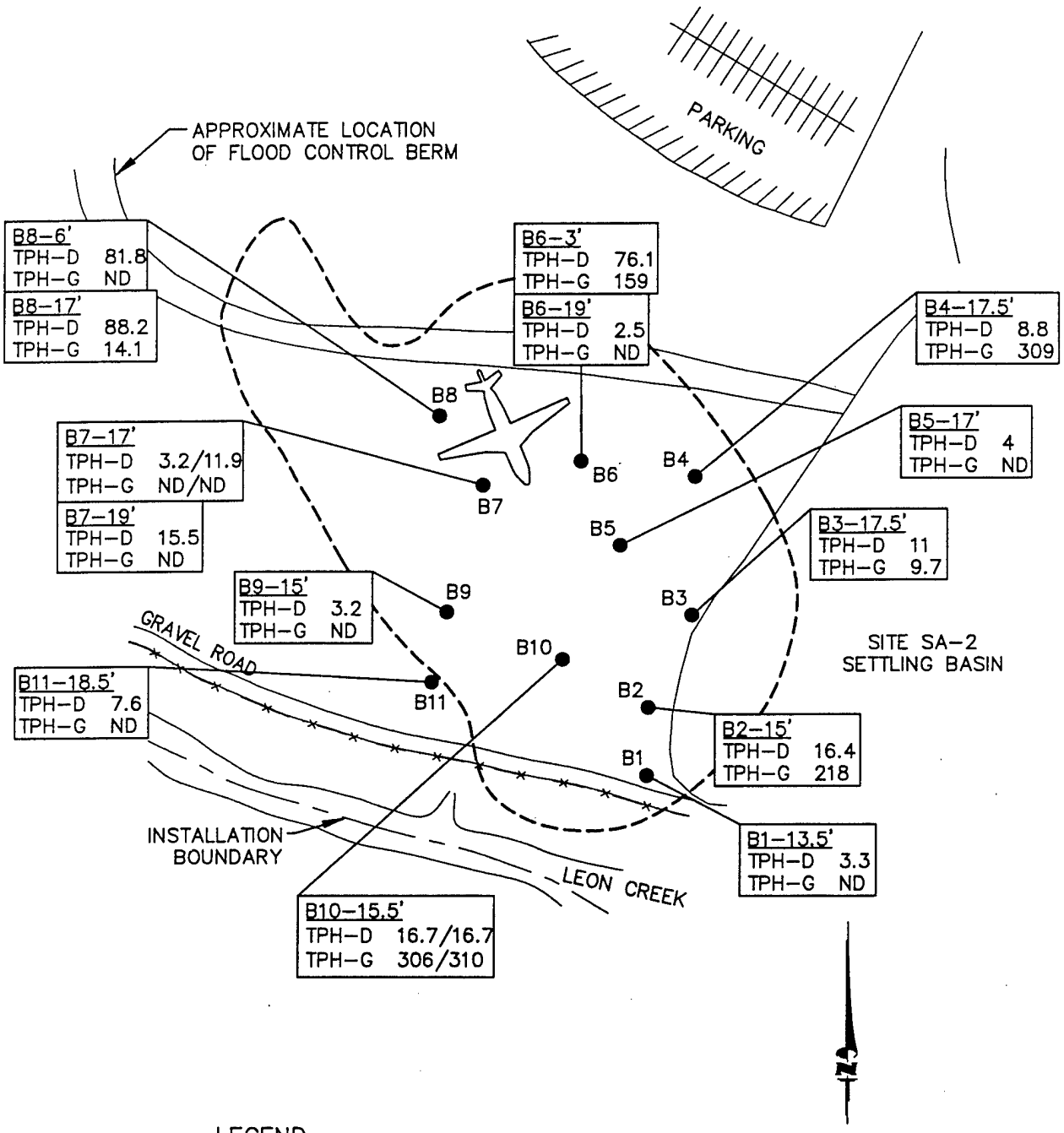
[a/] Analyzed by USEPA Method SW8015B.

[b/] bgs = below ground surface.

[c/] mg/kg = milligrams per kilogram.

[d/] < and gray shading = analyte concentration less than the sample quantitation limit shown.

[e/] Primary sample result/replicate sample result.



LEGEND

B7 ●	1998 SOIL BOREHOLE LOCATION
	1992 ESTIMATED AREA EXCEEDING 1,000 mg/kg TPH IN SOIL (PARSONS ES, 1998)
B10–15.5'	SAMPLE ID AND DEPTH (FEET BGS)
TPH–D	TOTAL PETROLEUM HYDROCARBONS DIESEL RANGE (mg/kg)
TPH–G	TOTAL PETROLEUM HYDROCARBONS GASOLINE RANGE (mg/kg)
ND	NOT DETECTED

FIGURE 3.1

TPH IN SOIL

Site FC-2
Kelly AFB, Texas

PARSONS ENGINEERING SCIENCE, INC.
Denver, Colorado

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3.1.2 BTEX and Other Volatile Organic Compounds

Table 3.2 and Figure 3.2 present the analytical results for VOCs detected in site soils. The BTEX components were detected in four of the sixteen samples analyzed for VOCs. The highest detection of total BTEX was 8.75 mg/kg at B6-3 (Interestingly, no BTEX compounds were detected in the sample collected from 19 feet bgs in borehole B6). Benzene was not detected in any of the samples analyzed. During installation of the expanded-scale bioventing system in January 1996, maximum concentrations of total BTEX (10.82 mg/kg) and benzene (8.72 mg/kg) were detected at VW6 at 13 feet bgs (Appendix A, Table 2.3). Soil borehole B10 was advanced approximately 15 feet south of VW6 and no BTEX compounds were detected at this location.

Other VOCs detected at IRP Site FC-2 during the June 1998 soil sampling event include 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-isopropyltoluene, chlorobenzene, isopropylbenzene, n-propylbenzene, naphthalene, sec-butylbenzene, and t-butylbenzene (Table 3.2). Figure 3.2 shows the distribution of total VOCs in site soils. The highest total VOC concentrations were detected in soil samples B2-15 (139.4 mg/kg), B5-17 (23.9 mg/kg) and B6-3 (24.3 mg/kg). Low concentrations (less than 1.0 mg/kg) were detected in samples B4-17.5, B8-17, B10-15.5, and B11-18.5. No VOCs were detected in the samples from boreholes B1, B3, B7, B9, nor were VOCs detected in samples B6-19 and B8-6.

3.1.3 Semivolatile Organic Compounds

As shown in Figure 3.2 and Table 3.3, SVOCs were detected in four confirmation soil samples collected from three of the sixteen soil boreholes (B2-15, B6-3, and B10-15.5 and its sample replicate). Similar to the VOC sample results, the maximum concentration of SVOCs (42.3 mg/kg) were detected in the smear zone soil sample B2-15. Maximum concentrations of naphthalene (8.88 mg/kg), 2-methylnaphthalene (24.5 mg/kg), and bis(2-Ethylhexyl)phthalate (8.88 mg/kg) were detected at this location. The second highest SVOC concentrations in soil were observed at B6-3 (8.0 mg/kg); however, like most of the other SVOC detects, results for this sample were estimated by the laboratory because all detected SVOCs were below the sample quantitation limit (i.e., "J-flagged").

3.1.4 Metals

At the request of the USEPA (1998), metals were analyzed in site soil during the confirmation sampling event. Thirteen of 19 metals were detected in the seven soil samples collected from 1 to 3 feet bgs during the confirmation sampling event (Table 3.4). Maximum concentrations of cadmium (13.6 mg/kg) chromium (29.9 mg/kg), copper (29.5 mg/kg), lead (80.7 mg/kg), mercury (0.43 mg/kg), nickel (40.8 mg/kg), silver (8.49 mg/kg), and zinc (153 mg/kg) were detected in the sample collected from borehole B6 at 3 feet bgs. Cadmium, mercury, and silver were not detected in any of the other six surface samples. Arsenic was detected in all samples at concentrations less than the sample quantitation limit, but greater than the detection limit. Other than the laboratory estimated concentration of arsenic at B10-1 (28.9J mg/kg) and the

TABLE 3.2
VOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL
SITE FC-2
KELLY AFB, TEXAS

Sample	Depth (feet bgs[a/])	1,2,4-Tri-methyl-benzene (mg/kg[b/])	1,3,5-Tri-methyl-benzene (mg/kg)	4-Isopropyl toluene (mg/kg)	Benzene (mg/kg)	Chloro-benzene (mg/kg)	Ethyl-benzene (mg/kg)	Isopropyl-benzene (mg/kg)	n-Propyl-benzene (mg/kg)	Naph-thalene (mg/kg)	sec-Butyl-benzene (mg/kg)	t-Butyl-benzene (mg/kg)	Toluene (mg/kg)	m,p-Xylene (mg/kg)	o-Xylene (mg/kg)
FC2-B1	13.5	<0.0092[c/]	<0.0039	<0.0079	<0.0026	<0.0026	<0.0039	<0.0105	<0.0026	<0.0026	<0.0092	<0.0092	<0.0066	<0.0039	<0.0066
FC2-B2	15	40.8	22.9	1.04 J[d/]	<0.417	26.9	1.88	<1.67	8.96	7.29	24.2	3.12	<1.04	2.29	<1.04
FC2-B3	17.5	<0.009	<0.0038	<0.0077	<0.0026	<0.0026	<0.0038	<0.0103	<0.0026	<0.0026	<0.009	<0.009	<0.0064	<0.0038	<0.0064
FC2-B4	17.5	0.214	0.0989	0.0879	<0.011	<0.011	<0.0165	<0.044	0.033	0.165	0.0659	<0.0385	<0.0275	<0.0165	<0.0275
FC2-B5	17	8.44 D[e/]	5.43	3.08 D	<0.013	4.22 D	0.182	<0.0519	1.3 D	0.156	<0.0455	0.292	<0.325	0.812 D	0.0455
FC2-B6	3	5.16	5.97	0.734	<0.0109	<0.0109	2.60	0.891	1.68	1.09	<0.038	<0.038	0.125	5.52	0.5
FC2-B6	19	<0.0073	<0.0031	<0.0062	<0.0021	<0.0021	<0.0031	<0.0083	<0.0021	<0.0021	<0.0073	<0.0073	<0.0052	<0.0031	<0.0052
FC2-B7	17	<0.0095	<0.0041	<0.0081	<0.0027	<0.0027	<0.0041	<0.0108	<0.0027	<0.0027	<0.0095	<0.0095	<0.0068	<0.0041	<0.0068
FC2-DUP-D[f/]	17	<0.0455	<0.0195	<0.039	<0.013	<0.013	<0.0195	<0.0519	<0.013	<0.013	<0.0455	<0.0455	<0.0325	<0.0195	<0.0325
FC2-B7	19	<0.0083	<0.0036	<0.0071	<0.0024	<0.0024	<0.0036	<0.0095	<0.0024	<0.0024	<0.0083	<0.0083	<0.006	<0.0036	<0.006
FC2-B8	6	<0.0402	<0.0172	<0.0345	<0.0115	<0.0115	<0.0172	<0.046	<0.0115	<0.0115	<0.0402	<0.0402	<0.0287	<0.0172	<0.0287
FC2-B8	17	<0.0422	<0.0181	<0.0361	<0.012	<0.012	<0.0181	0.0663	<0.012	<0.012	<0.0422	<0.0422	<0.0301	<0.0181	<0.0301
FC2-B9	15	<0.0091	<0.0039	<0.0078	<0.0026	<0.0026	<0.0039	<0.0104	<0.0026	<0.0026	<0.0091	<0.0091	<0.0065	<0.0039	<0.0065
FC2-B10	15.5	<0.0412	<0.0176	0.0529	<0.0118	<0.0118	<0.0176	<0.0471	<0.0118	<0.0118	<0.0412	<0.0412	<0.0294	<0.0176	<0.0294
FC2-DUP-E[g/]	15.5	<0.0417	<0.0179	<0.0357	<0.0119	<0.0119	<0.0179	<0.0476	<0.0119	<0.0119	<0.0417	<0.0417	<0.0298	<0.0179	<0.0298
FC2-B11	18.5	0.0034 J	<0.0034	<0.0067	<0.0022	0.009	0.0056	<0.009	<0.0022	0.0112	<0.0079	<0.0079	0.0236	<0.0034	<0.0056
Maximum Concentration		40.8	22.9	3.08 D	<0.417	26.9	2.60	0.891	8.96	7.29	24.2	3.12	0.125	5.52	0.5
Soil Cleanup Level[h/]		100[i/]	100[i/]	---[j/]	0.5	10	70	---	---	73	---	---	100	1,000	1,000

Note: Samples analyzed by USEPA Method SW8260B.

[a/] bgs = below ground surface.

[b/] mg/kg = milligrams per kilogram.

[c/] < and gray shading = analyte concentration less than the sample quantitation limit shown.

[d/] J = analyte detected at a concentration less than the sample quantitation limit, but greater than the method detection limit; value shown is a laboratory estimated concentration.

[e/] D = analyte result at a secondary dilution factor.

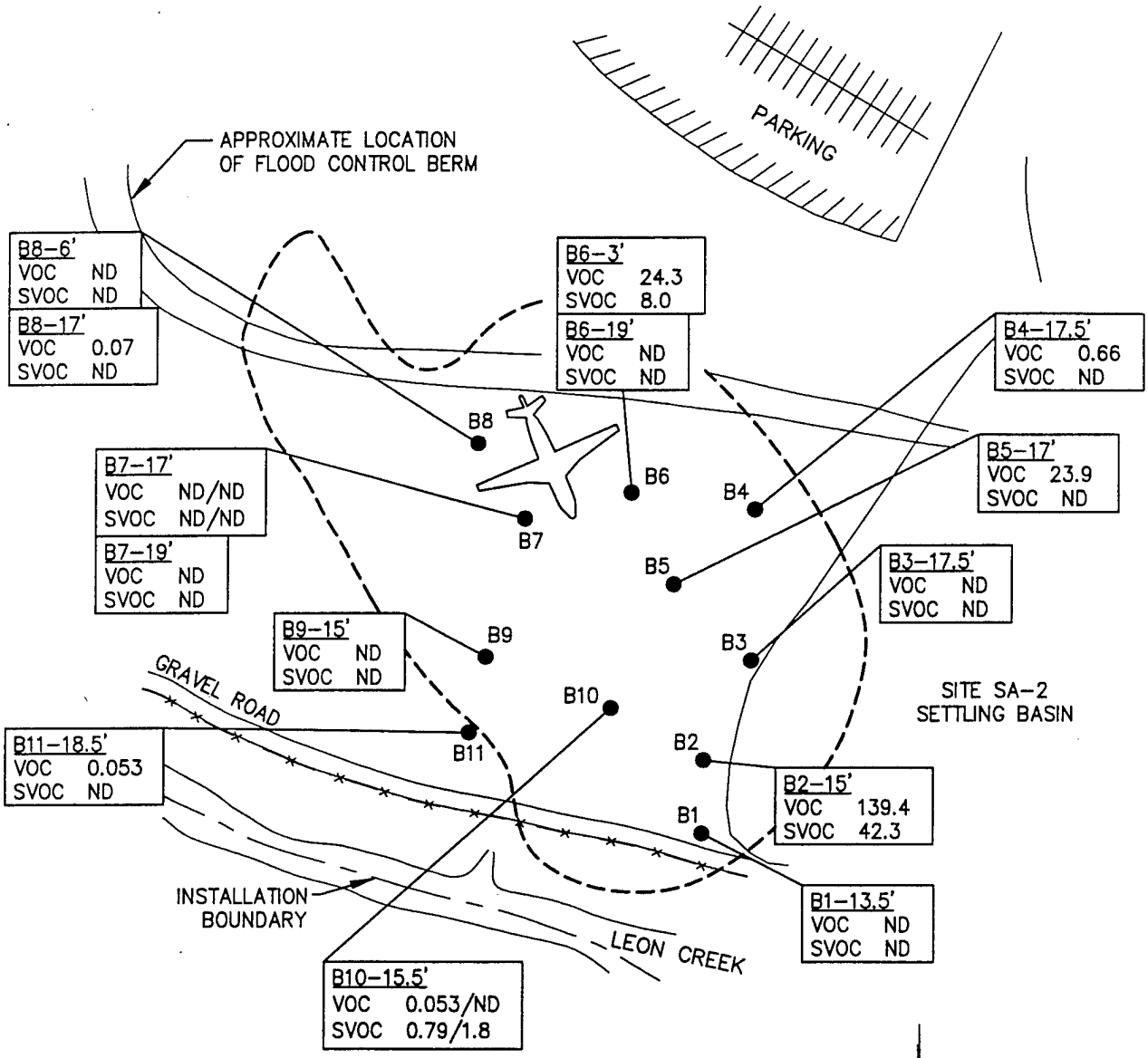
[f/] FC2-DUP-D is a replicate of FC2-B7-17.

[g/] FC2-DUP-E is a replicate of FC2-B10-15.5

[h/] Risk Reduction Standard 2 (RRS 2) Medium Specific Concentration (MSC) for residential use based on groundwater protection (GWP-Res) (TNRCC, 1998).

[i/] MSC for GWP-Res for the 1,2,3-trimethylbenzene isomer.

[j/] --- = no MSC available.



LEGEND

B7 ●	1998 SOIL BOREHOLE LOCATION
	1992 ESTIMATED AREA EXCEEDING 1,000 mg/kg TPH IN SOIL (PARSONS ES, 1998)
B10–15.5'	SAMPLE ID AND DEPTH (FEET BGS)
VOC	VOLATILE ORGANIC COMPOUND CONCENTRATION (mg/kg)
SVOC	SEMIVOLATILE ORGANIC COMPOUND CONCENTRATION (mg/kg)
0.053/ND	PRIMARY SAMPLE RESULT/REPLICATE SAMPLE RESULT
ND	NOT DETECTED

FIGURE 3.2

VOCs AND SVOCs IN SOIL

Site FC-2
Kelly AFB, Texas

PARSONS ENGINEERING SCIENCE, INC.
Denver, Colorado

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TABLE 3.3
SEMIVOLATILE ORGANIC COMPOUNDS DETECTED IN SOIL
SITE FC-2
KELLY AFB, TEXAS

Sample	Depth (feet bgs[a/])	2-Methyl-naphthalene (mg/kg[b/])	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benzo(a)-anthracene (mg/kg)	Bis-(2-ethylhexyl)-phthalate (mg/kg)	Chrysene (mg/kg)	Dibenzo-furan (mg/kg)	Fluor-anthene (mg/kg)	Fluorene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)
FC2-B1	13.5	<0.921[c/]	<0.921	<0.921	<0.921	<0.921	<0.921	<0.921	<0.921	<0.921	<0.921	<0.921	<0.921
FC2-B2	15	24.5	<23.3	<23.3	<23.3	8.88	<23.3	<23.3	<23.3	<23.3	8.88	<23.3	<23.3
FC2-B3	17.5	<0.897	<0.897	<0.897	<0.897	<0.897	<0.897	<0.897	<0.897	<0.897	<0.897	<0.897	<0.897
FC2-B4	17.5	<0.769	<0.769	<0.769	<0.769	<0.769	<0.769	<0.769	<0.769	<0.769	<0.769	<0.769	<0.769
FC2-B5	17	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909
FC2-B6	3	2.17 J[d/]	0.725 J	<3.8	<3.8	2.53 J	<3.8	0.543 J	0.362 J	0.543 J	0.543 J	<3.8	0.543 J
FC2-B6	19	<0.729	<0.729	<0.729	<0.729	<0.729	<0.729	<0.729	<0.729	<0.729	<0.729	<0.729	<0.729
FC2-B7	17	<0.946	<0.946	<0.946	<0.946	<0.946	<0.946	<0.946	<0.946	<0.946	<0.946	<0.946	<0.946
FC2-DUP-D[e/]	17	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909
FC2-B7	19	<0.833	<0.833	<0.833	<0.833	<0.833	<0.833	<0.833	<0.833	<0.833	<0.833	<0.833	<0.833
FC2-B8	6	<4.02	<4.02	<4.02	<4.02	<4.02	<4.02	<4.02	<4.02	<4.02	<4.02	<4.02	<4.02
FC2-B8	17	<0.843	<0.843	<0.843	<0.843	<0.843	<0.843	<0.843	<0.843	<0.843	<0.843	<0.843	<0.843
FC2-B9	15	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909	<0.909
FC2-B10	15.5	<4.12	<4.12	<4.12	<4.12	0.785 J	<4.12	<4.12	<4.12	<4.12	<4.12	<4.12	<4.12
FC2-DUP-E[f/]	15.5	<0.833	<0.833	0.080 J	0.080 J	0.873	0.080 J	<0.833	0.318 J	<0.833	<0.833	0.158 J	0.238 J
FC2-B11	18.5	<0.787	<0.787	<0.787	<0.787	<0.787	<0.787	<0.787	<0.787	<0.787	<0.787	<0.787	<0.787
Maximum Concentration		24.5	0.725 J	0.080 J	0.080 J	8.88	0.080 J	0.543 J	0.362 J	0.543 J	8.88	0.158 J	0.543 J
Soil Cleanup Level[g/]		150	220	1,100	0.012	0.60	1.2	---[h/]	150	150	73	110	110

Note: Samples analyzed by USEPA Method SW8270C.

[a/] bgs = below ground surface.

[b/] mg/kg = milligrams per kilogram.

[c/] < and gray shading = analyte concentration less than the sample quantitation limit shown.

[d/] J = analyte detected at a concentration less than the sample quantitation limit, but greater than the method detection limit; value shown is a laboratory estimated concentration.

[e/] FC2-DUP-D is a replicate of FC2-B7-17.

[f/] FC2-DUP-E is a replicate of FC2-B10-15.5.

[g/] Risk Reduction Standard 2 (RRS 2) Medium Specific Concentration (MSC) for residential use based on groundwater protection (GWP-Res) (TNRCC, 1998).

[h/] --- = no MSC available.

TABLE 3.4
METALS IN SOIL
SITE FC-2
KELLY AFB, TEXAS

Sample :	FC2-B2	FC2-B5	FC2-B6	FC2-B7	FC2-DUP-C[c/]	FC2-B8	FC2-B10	Maximum	Soil
Depth (feet bgs[a/]):	3	1	3	1	1	1	1	Concentration	Cleanup Level[d/]
Constituent	(mg/kg[b/])	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aluminum	17,600	5,320	3,360	12,800	13,800	16,000	2,780	17,600	3,700
Antimony	<49.9[e/]	<40.9	<42.5	<45.4	<45.5	<45.6	<41.1	<49.9	0.6
Arsenic	3.31 J[f/]	2.53 J	3.39 J	3.18 J	4.23 J	2.74 J	28.9 J	28.9 J	5
Barium	89.9	26.2	39.7	74.9	119	51.2	19.4	119	200
Beryllium	<0.38	<0.31	<0.32	<0.34	<0.34	<0.34	<0.31	<0.38	0.4
Cadmium	<4.99	<4.09	13.6	<4.54	<4.55	<4.56	<4.11	13.6	0.5
Chromium	14.2	4.91 J	29.9	14.4	11.9	11.6	4.32 J	29.9	10
Cobalt	4.24 J	<7.15	<7.43	3.63 J	4.55 J	<8	<7.21	4.55 J	220
Copper	3.49 J	2.04 J	29.5	6.59 J	6.37 J	2.4 J	<6.18	29.5	130
Lead	15 J	16.3 J	80.7	36.6 J	18.8 J	6.86 J	4.94 J	80.7	1.5
Manganese	312	107	107	243	383	126	95.9	383	170
Mercury	<0.12	<0.1	0.43	<0.11	<0.12	<0.12	<0.1	0.43	0.2
Molybdenum	<9.98	<8.18	<8.49	<9.09	<9.1	<9.14	<8.24	<9.98	18
Nickel	9.98 J	5.05 J	40.8	9.31 J	9.1 J	6.62 J	2.06 J	40.8	73
Selenium	<99.8	<81.8	<84.9	<90.9	<91	<91.4	<82.4	<99.8	5
Silver	<8.74	<7.15	8.49	<7.95	<7.97	<8.0	<7.21	8.49	18
Thallium	<49.9	<40.9	<42.5	<45.4	<45.5	<45.6	<41.1	<49.9	0.2
Vanadium	14.5	6.54 J	7.01 J	14.1	12.6	13.9	6.79 J	14.5	26
Zinc	39.4	17.6	153	49.3	48.5	27.4	11.1	153	1,100

Note: Samples analyzed by USEPA Method SW6010B, except for mercury which was analyzed by Method SW7141.

[a/] bgs = below ground surface.

[b/] mg/kg = milligrams per kilogram.

[c/] FC2-DUP-C is a replicate of FC2-B7-1.

[d/] Risk Reduction Standard 2 (RRS 2) Medium Specific Concentration (MSC) for residential use based on groundwater protection (GWP-Res) (TNRCC, 1998).

[e/] < and gray shading = analyte concentration less than the sample quantitation limit shown.

[f/] J = analyte detected at a concentration less than the sample quantitation limit, but greater than the method detection limit; value shown is a laboratory estimated concentration.

maximum detected aluminum concentration (17,600 mg/kg) at B2-3, it was not readily apparent from the metals data that concentrations of metals in soil were higher in the southeast portion of the site.

3.1.5 Soil Data Summary and Bioventing System Effectiveness

Field screening and analytical results indicate that the most significant TPH-g, VOC, and SVOC contamination is limited primarily to smear-zone soils to the southeast of the mock-up airplane (boreholes B2, B4, B5, and B10). Soils in the smear zone typically have higher moisture content and may be saturated during parts of the year as groundwater elevations fluctuate. These factors can limit the air-filled porosity and air permeability of smear-zone soils, and thereby may limit the effectiveness of bioventing.

Elevated TPH-d, TPH-g, VOC, and SVOC concentrations at B6-3 and elevated TPH-d concentrations at B8-6 and B8-17 indicate that these soils may be outside the effective treatment area of the expanded bioventing system. During bioventing pilot testing performed in 1992 and 1993, the long-term radius of oxygen influence for VW1 exceeded 35 feet bgs; however, borehole B6 is located approximately 45 feet from VW2 and borehole B8 is located approximately 90 feet from VW1 and VW2.

Nonetheless, the decreased TPH and BTEX concentrations as compared to samples collected prior to pilot-scale and expanded-scale bioventing (Appendix A, Table 2.3) indicate that petroleum hydrocarbon concentrations in site soils have been significantly reduced via enhanced aerobic biodegradation resulting from air injection. The lack of benzene detected in site soils suggests that this potential source for groundwater contamination (by partitioning of benzene from soil to groundwater) has essentially been eliminated by bioventing treatment of site soils. In addition, the low concentrations of toluene, ethylbenzene, and xylenes remaining in site soil are not likely to significantly impact site groundwater.

Elevated concentrations of metals at B6-3 suggest that some metals may have been introduced into soils near the simulated airplane as a result of POL disposal and fire control training exercises formerly performed in this area. However, significantly lesser concentrations of metals in soil were generally observed in the other surface soil samples collected near the airplane (B7-1 and its replicate and B8-1). Although the southeast portion of the site has been included in OU4 because of metals contamination (Halliburton NUS, 1997), soil sample data did not indicate higher soil concentrations of metals in this area.

3.2 SOIL CLEANUP LEVELS

The primary objectives of the confirmation soil sampling at IRP Site FC-2 were to document reductions in petroleum hydrocarbon concentrations in soil and to collect soil data in support of an Air Force NFRAP decision for soils contaminated with organic constituents in the immediate vicinity of the former fire control training area, pursuant to site closure. In documenting readiness for site closure, confirmation soil sample results were compared to RRS 2 requirements detailed in 30 TAC Subchapter S,

Section 335. Because portions of Site FC-2 are included in both soil OU3 (organics) and soil OU4 (inorganics) and air injection bioventing is not an effective treatment for metals contamination, confirmation soil sampling was meant to determine whether VOCs and SVOCs previously detected at the site have been sufficiently reduced through air injection bioventing to enable future corrective action at the site to focus only on the inorganic compounds.

3.2.1 Land Use and Potential Receptors

Site FC-2 is currently vacant, and land uses adjacent to the site are primarily industrial. While current and projected future land-use scenarios for Site FC-2 and its vicinity are industrial in nature, residential cleanup goals were chosen as cleanup criteria for comparison because of the close proximity of Leon Creek and the potential impact of contaminant migration from soils to groundwater, followed by dissolved contaminant transport to Leon Creek. Based on a residential land use assumption, future residents are the primary human receptor populations.

3.2.2 Comparison to Risk Reduction Standard 2 Levels

Confirmation soil sample results were compared to RRS 2 MSCs as established by TNRCC (1998b). The MSCs represent numeric cleanup levels in contaminated media considering various human exposure routes (ingestion and inhalation) and cross-media contamination of air and groundwater from contaminated soils. The residential groundwater-protective MSCs represent concentrations in residential soil assumed to be protective of underlying groundwater considering cross-media contamination of groundwater from contaminated soil. Because they represent the most conservative (lowest) soil MSCs, the groundwater-protective MSCs were used for comparison to confirmation soil data.

The maximum concentrations of VOCs, SVOCs, and metals as compared to the RRS 2 groundwater protective MSCs ("soil cleanup levels") are shown on Tables 3.2, 3.3, and 3.4, respectively. Based on this comparison, one VOC (chlorobenzene), two SVOCs (benzo[a]anthracene and bis[2-Ethylhexyl]phthalate), and seven metals (aluminum, arsenic, cadmium, chromium, lead, manganese, and mercury) were detected in soil samples at concentrations exceeding the proposed cleanup levels. The chlorobenzene exceedance occurred in only one sample, B2-15 at 26.9 mg/kg. The RRS 2 criteria for bis(2-Ethylhexyl)phthalate was exceeded in four soil samples, and the greatest concentration also was detected at B2-15 (8.88 mg/kg). MSCs were not available for several VOCs and one SVOC because of a lack of toxicity data (TNRCC, 1998).

Sample quantitation limits for some of the SVOCs exceeded the RRS 2 MSCs for residential groundwater protection thereby limiting definitive determination of soil remediation status. Benzo(a)anthracene was only detected in one soil sample (DUP-E; the duplicate for B10-15.5), but as shown on Table 3.3, the sample quantitation limit consistently exceeded the proposed soil cleanup level for benzo(a)anthracene. This was also the case for some of the chrysene sample results and for all of the bis(2-

Ethylhexyl)phthalate results. Lower sample quantitation limits could have been attained for benzo(a)anthracene and chrysene by using USEPA Method SW8310; however, USEPA Method SW8270 was chosen for analysis of SVOCs because of previous investigation results that indicated bis(2-Ethylhexyl)phthalate was present in site soils (Appendix A, SAP Table 3.1). Similarly, the sample quantitation limits for some of the metals (antimony, cadmium, selenium, and thallium) also exceeded the RRS 2 MSCs for residential groundwater; therefore, it is not possible to conclude that concentrations of these metals in soil are below regulatory criteria.

As presented in the SAP (Appendix A), if the maximum detected concentration of a VOC or SVOC exceeded the RRS 2 cleanup criteria, the 95-percent upper confidence limit (UCL) concentration on the mean for that contaminant was to be calculated and then compared to the RRS 2 cleanup criteria. However, this approach was not applied to the sample data because of the insufficient sample quantitation limits for the SVOCs previously mentioned and because of a recent change in TNRCC (1998a) guidance, regarding the requisite number of samples for site closure.

3.3 LABORATORY GROUNDWATER RESULTS

Six groundwater samples and one duplicate were collected at IRP Site FC-2 and submitted for laboratory analysis of VOCs (including BTEX). Additionally, groundwater samples were analyzed for various geochemical parameters to assess the efficacy of remediation by natural attenuation. Free-phase product was not detected in any of the six wells sampled; however, an oily sheen was observed in monitoring well F202 during the sampling event. Groundwater sample results are presented in Table 3.5.

No VOCs were detected above the respective sample quantitation limits for the seven groundwater samples submitted for analysis. This includes the groundwater sample collected from monitoring well E309 which is located downgradient of soil borehole location B2, the location where the highest smear-zone contamination was identified in site soils (Tables 3.2 and 3.3). The sample quantitation limits for the VOCs in groundwater were below the TNRCC (1998b) residential groundwater cleanup criteria for all but the following compounds (residential cleanup criteria concentrations are shown in parentheses); 1,2-dibromo-3-chloropropane, (0.2 micrograms per liter [μg/L]), 1,3-dichloropropene (0.47 μg/L), and 1,2,3-trichloropropane (0.012 μg/L). Complete groundwater analytical results are presented in Appendix C.

3.4 NATURAL ATTENUATION IN GROUNDWATER

Although no volatile hydrocarbons were detected in the six groundwater monitoring wells sampled in June 1998, some petroleum hydrocarbons remain in site soils and can continue to partition into groundwater. Therefore, the potential for natural biodegradation of dissolved hydrocarbons in groundwater was evaluated considering the sample results for various geochemical parameters shown in Table 3.5.

TABLE 3.5
VOLATILE ORGANIC COMPOUNDS AND GEOCHEMICAL INDICATORS IN GROUNDWATER
SITE FC-2
KELLY AFB, TEXAS

Sample Location	Volatile Organic Compounds	Temperature (°C[a/])	pH	Dissolved Oxygen (mg/L[b/])	Ferrous Iron (mg/L)	Manganese (mg/L)	Nitrate as Nitrogen (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Redox Potential (mV)[c/]	Methane (mg/L)
F202 (FT024MW002)	ND[d/]	25.3	6.89	0.32	3.65	0.6	1.2	93.5	0.029	-116.7	0.634/0.952[e/]
F203 (FT024MW003)	ND	27.6	6.70	0.52	4.74	2.4	1.3	170	0.004	-113.2	NA[f/]
F204 (FT024MW004)	ND	21.3	6.38	0.83	1.22/1.16	0.4/0.4	1.7/1.4	78/78	0.012/0.014	-38.3	NA
F205 (FT024MW005)	ND	24.4	6.75	0.37	3.86	0.7	2.3	65	0.016	-218.8	NA
E309 (WP022MW009)	ND	22.6	7.13	0.51	6.8	0.0	2.0	80.5	0.019	-113.8	NA
TC-11 (ST10MW019)	ND	21.5	6.65	0.51	4.98	1.3	1.0	93.5	0.024	-106.3	<0.013[g/]

Note: Samples analyzed by USEPA Methods SW8260B, SW8015M, and SW9056 for VOCs, methane, and sulfate, respectively. Other analytes measured in the field by Hach kit analyses.

[a/] °C = degrees Celsius.

[b/] mg/L = milligrams per liter.

[c/] Redox = reduction/oxidation; mV = millivolts.

[d/] ND = not detected.

[e/] Primary sample result/replicate sample result.

[f/] NA = Not analyzed.

[g/] < = analyte concentration less than the laboratory reporting limit shown.

The positive effect of natural attenuation processes (e.g., advection, dispersion, sorption, and biodegradation) on reducing the actual mass of fuel-related contamination dissolved in groundwater has been termed remediation by natural attenuation (RNA). To estimate the impact of natural attenuation on the fate and transport of BTEX compounds dissolved in groundwater at a site, two important lines of evidence should be demonstrated (Wiedemeier *et al.*, 1995). The first is a documented loss of contaminants at the field scale. The second line of evidence involves the use of geochemical data to show that areas with BTEX contamination can be correlated to areas with depleted electron acceptor (e.g., oxygen, nitrate, and sulfate) concentrations and increases in metabolic fuel degradation byproduct concentrations (e.g., methane, sulfide, and ferrous iron). While a review of historical groundwater sample results was beyond the scope of this project, the geochemical indicator results in combination with the nondetect results for VOCs in site groundwater indicate that natural attenuation of dissolved fuel hydrocarbon contaminants is occurring at Site FC-2 and that sufficient concentrations of electron acceptors are present to sustain biodegradation. The primary conclusions which can be drawn from geochemical parameter results for Site FC-2 are briefly summarized.

- Dissolved oxygen (DO) concentrations were depleted (less than 1 milligrams per liter [mg/L]) throughout the site, including well TC11 (0.51 mg/L), the furthest upgradient monitoring well. The lack of dissolved VOCs in site groundwater puts no further biological demand on the already reduced DO concentrations. These data suggest that DO is not actively used as an electron acceptor at Site FC-2. In addition, the redox conditions in site groundwater are not favorable for aerobic biodegradation.

- Nitrate can only function as an electron acceptor in microbially facilitated fuel hydrocarbon degradation reactions if the groundwater system has been depleted of oxygen (i.e., the groundwater must be functionally anaerobic). The lowest nitrate concentration was detected at well TC11, the most upgradient monitoring well. These results suggest that nitrate is not actively being utilized as an electron acceptor in the mineralization of dissolved hydrocarbons at this site.

- Manganese also can be used as an electron acceptor to facilitate the oxidation of fuel hydrocarbon compounds under anaerobic and slightly reducing conditions. Concentrations of reduced manganese range from 0 to 2.3 mg/L with the second highest detection, 1.3 mg/L at the upgradient well TC11. Redox conditions are not favorable for manganese reduction. Although the data suggest that manganese reduction may be occurring upgradient, it does not appear to be an active biodegradation mechanism at the site.

- The concentrations of ferrous iron are relatively high throughout the site and upgradient well TC11 had the second highest concentrations. Because the reduction of ferric iron (Fe^{3+}) to ferrous iron (Fe^{2+}) cannot proceed without microbial intervention, the elevated concentrations of ferrous iron measured in contaminated groundwater at the site is a strong indicator of microbial activity

upgradient from the site. The redox potential of the groundwater is in the range favorable to iron reduction.

- Sulfate may be used as an electron acceptor during microbial degradation of fuel hydrocarbons under anaerobic and strongly reducing conditions. The concentrations of sulfate and sulfide throughout the site do not suggest sulfate reduction is significant at Site FC-2.

- Methane was not detected at the upgradient well TC11, but was detected at well F202, located immediately downgradient from the source area, at an average concentration of 0.79 mg/L (considering the primary and replicate sample results). This concentration of methane suggests that methanogenesis is occurring in groundwater where conditions are sufficiently reducing and an organic carbon source is present.

- Redox potential is a measure of the relative tendency of a solution to accept or transfer electrons. The redox potential of a groundwater system depends on which electron acceptors are being reduced by microbes during oxidation of hydrocarbons. The redox potentials measured at Site FC-2 ranges from -218.8 millivolts (mV) to -38.3 mV. These redox potentials are within the range in which reduction of nitrate, iron, sulfate and carbon dioxide (methanogenesis) occur (Stumm and Morgan, 1981). Although the redox potentials measured at the existing wells are outside the range for manganese reduction, the reduced form of manganese measured in groundwater samples indicates that manganese reduction has occurred upgradient of the site.

The data presented suggest natural attenuation processes including biodegradation have eliminated dissolved VOCs in site groundwater. Because VOCs were detected in site soils near the groundwater surface, natural attenuation processes appear to be active in limiting the concentrations of VOCs that leach from soil to groundwater to undetectable levels. The minimal mass of VOCs leaching from site soils has not created any significant demand on electron acceptors at the site. Geochemical indicator results for well TC11 suggest that groundwater at Site FC-2 has been impacted by an upgradient source of contamination.

SECTION 4

CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

Bioventing treatment of vadose zone soils at IRP Site FC-2 has significantly reduced the concentrations of BTEX and TPH in site soils. No benzene was detected in any of the 16 soil samples analyzed for VOCs. Concentrations of TPH in site soils have been reduced by 1 to 2 orders of magnitude as compared to concentrations measured prior to expanded-scale bioventing system startup in January 1996. Residual concentrations of TPH, VOCs, and SVOCs remain in shallow soils near soil borehole B6 and in smear zone soils downgradient from the former fire control training area most notably near soil borehole B2. Only chlorobenzene, benzo(a)anthracene and bis(2-ethylhexyl)phthalate exceeded their respective RRS 2 groundwater protective MSCs for residential soils (TNRCC, 1998b) based on the June 1998 confirmation sampling event.

Numerous metals are present in site soils at concentrations in excess of the groundwater protective RRS 2 criteria for residential soils (TNRCC, 1998b). Soil sample results indicate that metals concentrations in soil were generally highest in shallow soils on the east side of the former fire control training area (near borehole B6). Contrary to findings presented in the FS (Halliburton NUS, 1997), limited soil sampling in the southeastern portion of the site did not indicate that concentrations of metals in soil were elevated as compared to concentrations observed in the other site samples.

No VOCs were detected in groundwater samples collected in June 1998. Geochemical data suggests that natural attenuation is reducing concentrations of VOCs dissolved in groundwater from Site FC-2 and upgradient sources. Groundwater sample results also suggest that site soils are no longer a significant source for dissolved VOCs in groundwater.

4.2 RECOMMENDATIONS

The confirmation soil sampling results presented in Section 3 indicate that residual concentrations of organics in site soil have been reduced to below the most restrictive RRS 2 criteria for all but chlorobenzene, bis(2-ethylhexyl)phthalate, and benzo(a)anthracene. Because of these contaminants and elevated concentrations of inorganics detected during this and previous sampling events, closure of IRP Site FC-2 cannot be obtained using RRS 2 criteria, without further site remediation. Use of RRS 3 criteria for closure (i.e., closure based on site specific risk assessment and

establishment of post-closure care and/or institutional controls) may be possible without further site remediation, but was beyond the scope of this project.

Although soil and groundwater data suggest that VOC and SVOC contaminant levels have been significantly reduced by bioventing and natural biodegradation processes, it is recommended that operation of the bioventing system be continued to further remediate residual organics in site soils. Results from the Option 1 soil gas sampling and *in situ* respiration testing event support this recommendation. Results from this investigation conducted in February 1997 indicated that biodegradation of petroleum hydrocarbon contaminants in soil was still occurring at moderate rates with site soils returning to anoxic conditions when the bioventing system was shut down (Parsons ES, 1997). Continued operation of the bioventing system will help to further reduce concentrations of organic contaminants in soils while further remediation/closure approach alternatives for Site FC-2 are being evaluated and implemented.

SECTION 5

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APPENDIX A
CONFIRMATION SAMPLING AND ANALYSIS PLAN

DRAFT FINAL

Confirmation Sampling and Analysis Plan for Installation Restoration Program Site FC-2



Kelly Air Force Base
Texas

Prepared For

Air Force Center for Environmental Excellence
Brooks Air Force Base, Texas

and

SA-ALC/EMRO
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March 1998

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CONFIRMATION SAMPLING AND ANALYSIS PLAN FOR INSTALLATION RESTORATION PROGRAM SITE FC-2 KELLY AIR FORCE BASE, TEXAS

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TABLE OF CONTENTS

Page

ACRONYMS AND ABBREVIATIONS iii

SECTION 1 - INTRODUCTION 1-1

SECTION 2 - SITE DESCRIPTION 2-1

2.1 Site Location and History 2-1
2.2 Site Geology and Hydrogeology 2-1
2.3 Previous Site Investigations and Contaminant Remediation 2-3
2.3.1 Site Investigations 2-3
2.3.1.1 1986 Radian Corporation Investigation 2-3
2.3.1.2 1990 Roy F. Weston, Inc. Investigation 2-9
2.3.1.3 1991 NUS Investigation 2-9
2.3.1.4 1995 R.E. Wright Environmental Inc. Investigation 2-12
2.3.2 Parsons ES Bioventing Pilot and Extended Testing 2-12
2.3.2.1 Soil Sampling Results 2-14
2.3.2.2 Soil Gas Sampling Results 2-14
2.3.2.3 Respiration Test Results 2-19
2.3.2.4 Recommendations Following 1-Year of Expanded Bioventing 2-19
2.3.3 Groundwater Remediation 2-21

SECTION 3 - SOIL CLEANUP REQUIREMENTS 3-1

3.1 Site Characterization Requirements 3-1
3.2 Soil Cleanup Standards 3-1
3.2.1 Overview of Risk Reduction Standards 3-1
3.2.1.1 Risk Reduction Standard 1 3-1
3.2.1.2 Risk Reduction Standard 2 3-2
3.2.1.3 Risk Reduction Standard 3 3-2
3.2.1.4 Risk Reduction Standards for Site FC-2 3-3
3.2.2 Cleanup Criteria 3-3
3.2.2.1 Organics in Soil 3-3
3.2.2.2 Inorganics in Soil 3-6
3.2.2.3 Post Closure Care and Deed Certification 3-6

SECTION 4 - SITE CONFIRMATION SOIL AND GROUNDWATER SAMPLING AND ANALYSIS PLAN 4-1

4.1 Soil Sampling 4-1
4.1.1 Drilling, Sampling, and Equipment Decontamination 4-3
4.1.2 Soil Sample Analyses 4-4
4.2 Groundwater Sampling 4-4
4.2.1 Well Purging, Sample Collection, and Decontamination 4-4
4.2.1.1 Equipment Decontamination 4-4
4.2.1.2 Well Purging 4-12
4.2.1.3 Sample Extraction 4-12

TABLE OF CONTENTS (Continued)

Page

4.2.2 Onsite Chemical Parameter Measurement 4-13
4.2.2.1 Dissolved Oxygen Measurements 4-13
4.2.2.2 pH, Temperature, and Specific Conductance 4-13
4.2.2.3 Other Electron Acceptor Measurements 4-13
4.2.2.4 Reduction/Oxidation Potential 4-14
4.2.3 Sample Handling 4-14
4.2.4 Groundwater Analyses 4-14
4.3 Chain-Of-Custody Control 4-14
4.4 Quality Assurance/Quality Control Procedures 4-15
4.5 Management of Investigation-Derived Wastes 4-16

SECTION 5 - SITE CONFIRMATION SAMPLING REPORT FORMAT 5-1

SECTION 6 - KELLY AFB SUPPORT REQUIREMENTS 6-1

SECTION 7 - PROJECT SCHEDULE 7-1

SECTION 8 - POINTS OF CONTACT 8-1

SECTION 9 - REFERENCES CITED 9-1

LIST OF TABLES

No.	Title	Page
2.1	Organic Compounds Detected in Soil	2-6
2.2	Metals Detected in Soil	2-10
2.3	Bioventing Soil Analytical Results	2-15
2.4	Bioventing Field and Analytical Soil Gas Results	2-17
2.5	Respiration and Biodegradation Rates	2-20
3.1	Pre-Bioventing Soil Contaminant Levels Compared to Cleanup Criteria	3-5
4.1	Proposed Soil Sample Analytical Methods, Reporting Limits, and Number of Samples	4-5
4.2	Proposed Groundwater Sample Analytical Methods Reporting Limits, and Number of Samples	4-9

LIST OF FIGURES

No.	Title	Page
2.1	Site Layout	2-2
2.2	1992 Estimated Extent of Soil Contamination	2-4
2.3	Geologic Cross Section A-A'	2-5
4.1	Proposed Soil and Groundwater Sampling Locations	4-2

ACRONYMS AND ABBREVIATIONS

°C	degrees centigrade
µg/L	micrograms per liter
1,1,1-TCA	1,1,1-trichloroethane
1,2-DCA	1,2-dichlorethane
1,2-DCE	1,2-dichloroethene
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
COPC	chemical of potential concern
DO	dissolved oxygen
DOT	US Department of Transportation
ES	Engineering-Science, Inc.
FS	Feasibility Study
ID	inside diameter
IRP	Installation Restoration Program
IRPIMS	Installation Restoration Program Information System
IWTP	industrial wastewater treatment plant
LNAPL	light nonaqueous-phase liquid
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MP	monitoring point
MSC	medium specific concentration
NFRAP	No Further Response Action Planned
OU	operable unit
PAH	polynuclear aromatic hydrocarbon
Parsons ES	Parsons Engineering Science, Inc.
PCB	polychlorinated biphenyl
PID	photoionization detector
POL	petroleum, oils, and lubricants
ppmv	parts per million, volume per volume
QC	quality control
RAP	remedial action plan
RBCA	risk-based corrective action
redox	reduction oxidation
RSKSOP	Robert S. Kerr (Laboratory) Standard Operating Procedure
SA-ALC/EMRO	San Antonio Air Logistics Center/Environment Management
SAP	Sampling and Analysis Plan
SVOC	semivolatile organic compound
TAC	Texas Administrative Code
TCE	trichloroethene
TNRCC	Texas Natural Resource Conservation Commission

TPH	total petroleum hydrocarbons
TRPH	total recoverable petroleum hydrocarbons
TVH	total volatile hydrocarbons
TVHA	total volatile hydrocarbon analyzer
USCS	Unified Soil Classification System
USEPA	US Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
VW	vent well

SECTION 1

INTRODUCTION

This confirmation sampling and analysis plan (SAP) for Installation Restoration Program (IRP) Site FC-2, at Kelly Air Force Base (AFB), Texas has been prepared by Parsons Engineering Science, Inc. (Parsons ES) for submittal to the Texas Natural Resource Conservation Commission (TNRCC); the US Air Force Center for Environmental Excellence (AFCEE), Brooks AFB, Texas; and San Antonio - Air Logistics Center, Environmental Management Office (SA-ALC/EMRO), Kelly AFB, Texas. The SAP is intended to guide soil sampling at Site FC-2 to document the effectiveness of remediation of petroleum-hydrocarbon-contaminated soils and to support site closure. Site FC-2 is the location of a former fire training control area where waste petroleum, oils, and lubricants (POLs) were ignited and then extinguished during training exercises conducted by the Base fire department from the 1950s until 1981.

In 1992, Site FC-2 was selected as a pilot test site for the AFCEE Bioventing Initiative. The purpose of this initiative was to determine if *in situ* bioventing would be a feasible cleanup technology for source area petroleum-contaminated soils within the unsaturated zone. Under the initiative, Parsons ES (formerly Engineering-Science, Inc. [ES]) installed a pilot-scale bioventing system at Site FC-2 in December 1992, and provided initial pilot testing and additional testing following 1 year of pilot-scale system operation. The 1-year pilot test demonstrated that bioventing was an effective treatment technology for petroleum-contaminated soils, and as a result, the site was included in the AFCEE Extended Bioventing Project. In September 1994, Site FC-2 was funded for system expansion (Option 4) and 1 year of extended bioventing system operation followed by soil gas sampling and *in situ* respiration testing (Option 1) as part of the AFCEE Extended Bioventing Project. In anticipation that extended bioventing system operation would sufficiently remediate petroleum-contaminated soils, Site FC-2 also was funded for confirmation soil sampling (Option 2).

Based on February 1997 soil gas sampling and respiration testing results following 1-year of expanded bioventing system operation at Site FC-2, benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations in vadose zone soils appear to have been reduced to relatively insignificant concentrations, and the majority of remaining fuel contaminants are fairly recalcitrant to biodegradation, and composed primarily of longer-chained, semivolatile, non-mobile, hydrocarbons. Considering these findings, *in situ* bioventing appears to have reduced petroleum hydrocarbon contamination in site soils sufficiently to meet most, if not all, TNRCC Risk Reduction Standard 2 cleanup criteria (30 Texas Administrative Code [TAC] 35 Subchapter S).

The objective of the confirmation soil sampling is to support an Air Force no-further-response-action-planned (NFRAP) decision for the soils contaminated with organic fuel constituents in the immediate vicinity of the former fire training control area, pursuant to closure of IRP Site FC-2. The proposed confirmation sampling described in Section 4 targets unsaturated soils in the vicinity of the fire training control area, as well as impacted smear-zone soils downgradient from the site. Soil data will be used to evaluate residual contamination. It is anticipated that analytical results will meet TNRCC Risk Reduction Standard 2 criteria and demonstrate that no further remediation of regulated volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) is necessary at IRP Site FC-2.

At the request of AFCEE and Kelly AFB, limited groundwater sampling for dissolved contaminants and various geochemical indicators also is included in this SAP to document dissolved contamination in the vicinity of Site FC-2 and to examine whether natural attenuation of dissolved-phase hydrocarbon contamination is occurring. Groundwater at the site and at Kelly AFB is regulated and managed as a separate operable unit (OU), independent of site soils. While an evaluation of the nature, extent, and fate of groundwater contaminants at Site FC-2 and a comparison of groundwater contaminant levels to regulatory standards is beyond the scope of the Option 2 confirmation activities, the collection and reporting of groundwater data as proposed in this SAP should prove useful during future groundwater characterization and remediation activities in the vicinity of Site FC-2.

This SAP consists of nine sections, including this introduction. Section 2 includes a site description and history, and summaries of previous investigations and remediation activities. Section 3 summarizes cleanup requirements for Site FC-2. A detailed SAP is presented in Section 4. Analytical results will be presented in a confirmation sampling report as described in Section 5. Section 6 lists Kelly AFB support requirements, and Section 7 presents the proposed project schedule. Air Force, regulatory, and contractor points of contact are provided in Section 8, and cited references are provided in Section 9.

SECTION 2

SITE DESCRIPTION

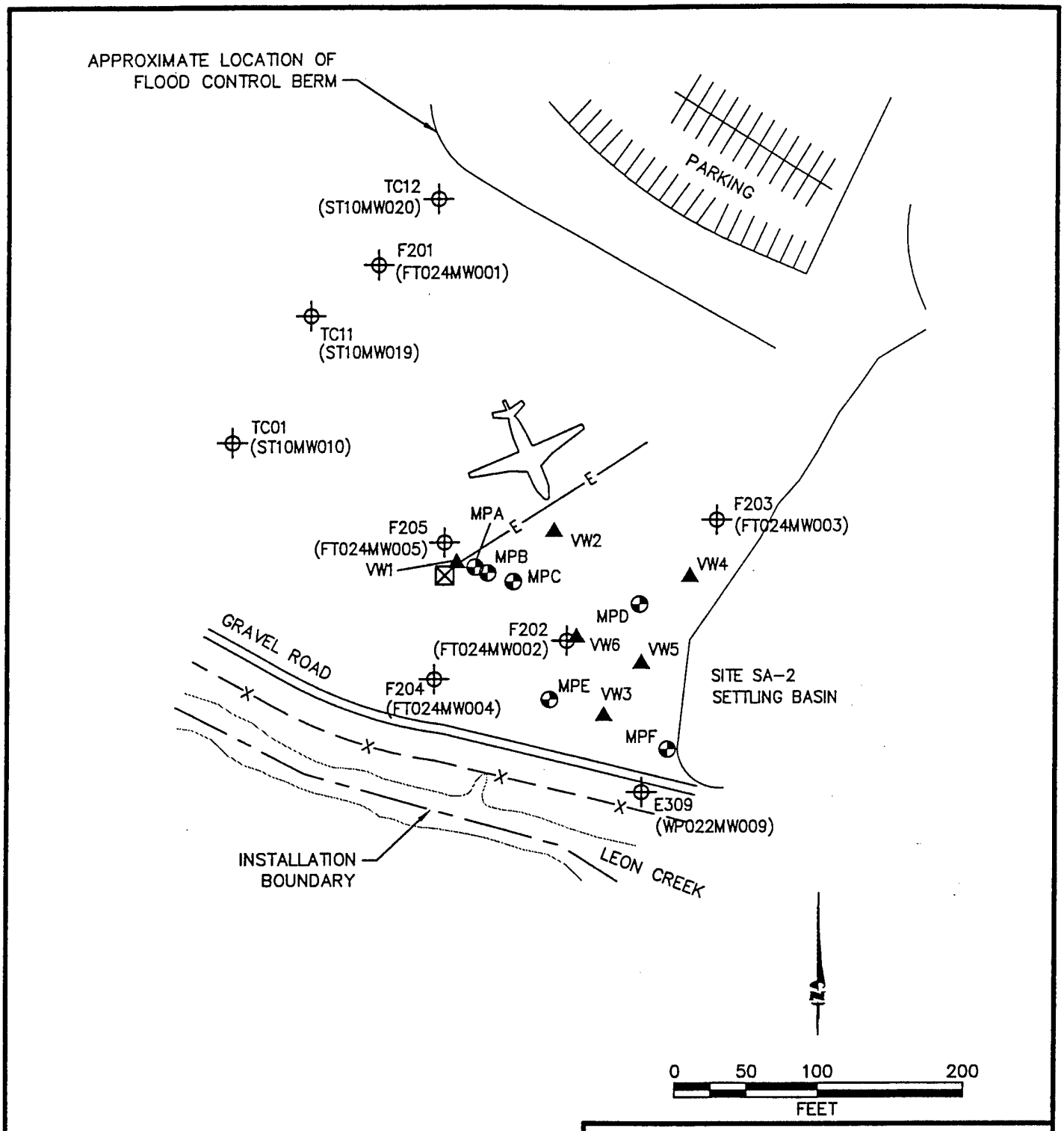
2.1 SITE LOCATION AND HISTORY

Site FC-2 is located in Zone 2, a 164-acre area in the southern portion of Kelly Air Force Base. Zone 2 is bounded by Military Drive, the Union-Pacific Railroad yards, and the southern Base boundary. Site FC-2 is located approximately 1,100 feet south of Military Highway and 100 feet north of Leon Creek. The site consists of a circular area, approximately 150 feet in diameter, where fire training control exercises were formerly conducted near a simulated airplane fuselage, and includes the downgradient area which extends southeast toward Leon Creek. The layout of Site FC-2 is presented in Figure 2.1. During the fire control training exercises which were performed from the 1950's until 1981, waste POLs were poured on the ground and ignited near the simulated airplane and then were extinguished with a water/protein mixture or aqueous, film-forming foam. These training exercises were performed two to four times per year. No collection facility or oil/water separator was used to stop direct infiltration of waste POLs into the ground.

Site FC-2 represents one of 16 individual IRP sites within Zone 2. The 16 sites are addressed collectively as Zone 2 because of their proximity to one another and the need to optimize soil and groundwater remediation in the entire area. The main sources of soil and groundwater contamination within Zone 2 include historic waste disposal through fire control training, chemical waste disposal in evaporation pits, and sludge drying in land spreading areas. Soils at 12 of the 16 sites (including FC-2) are contaminated with organic constituents at concentrations exceeding the preliminary remediation goals established in the feasibility study (FS) for Zone 2 soils (Halliburton NUS, 1997). Based on this contamination, these 12 sites have been grouped together into soil operable unit OU3. Other OU3 sites in the area of Site FC-2 include the jet engine test cell complex (Site S-9) located approximately 700 feet to the north, the industrial waste treatment plant (Site IWTP) located approximately 1,000 feet to the east, and the industrial waste sludge spreading area (Site SA-2) located approximately 150 feet southeast of the simulated airplane (Figure 2.1). It is also important to note that the southeastern quarter of IRP Site FC-2 has been included in soil OU4 because of inorganic constituent (metals) concentrations in soil that exceed acceptable risk levels (Halliburton NUS, 1997).

2.2 SITE GEOLOGY AND HYDROGEOLOGY

Approximately 8 to 18 feet of fill material is present across most of Site FC-2. This material is poorly sorted, brown clay to clayey gravel with minor amounts of caliche,



LEGEND

- F204 (FT024MW004) — EXISTING MONITORING WELL (IRPIMS WELL NUMBER SHOWN IN PARENTHESES)
- MPA — VAPOR MONITORING POINT
- VW1 — AIR INJECTION VENT WELL
- EXPANDED-SCALE BLOWER UNIT
- —E— BURIED ELECTRICAL CONDUIT
- —X— CHAIN LINK FENCE

FIGURE 2.1

SITE LAYOUT

Site FC-2
Kelly AFB, Texas

PARSONS ENGINEERING SCIENCE, INC.
Denver, Colorado

K:\AFCEE\726876\KELLY\97DN1046, 02/25/98 at 12:36

sand, and silt. Traces of wood, glass, metal, wire, and assorted construction materials were also encountered during sampling. Coarse-grained sands, gravels, or clayey gravels are encountered as shallow as 10 feet below ground surface (bgs) and extend to approximately 24 feet bgs. The coarse-grained sand and gravels are underlain by a mottled blue-gray to orange-brown, dense, plastic clay of the Navarro Group. The location of a geologic cross-section and a cross-section of the site is shown in Figures 2.2 and 2.3, respectively.

A shallow groundwater-bearing zone is encountered at Site FC-2 in the lower coarse-grained sediments above the Navarro clay layer at varying depths between 15 and 18 feet bgs. The Navarro clay underlying FC-2 results in significant lateral changes in the saturated thickness of the shallow water-bearing zone at the site. The saturated zone thickness ranges from 4.5 feet to 15.6 feet (NUS, 1992). Shallow groundwater flow in the vicinity of the site is south-southeasterly toward Leon Creek (NUS, 1992). The hydraulic gradient in the vicinity of the site is very low, averaging 0.0011 horizontal foot per vertical foot, and slug test data indicate an average hydraulic conductivity of 0.006 foot per second (NUS, 1992). Based on this information, and assuming an effective porosity of 30 percent, an average groundwater seepage velocity of 1 foot per day has been estimated for the site (NUS, 1992).

Site FC-2 and Kelly AFB are located above the reservoir zone of the Edwards Aquifer, which is the primary source of drinking water for the area. The Edwards Aquifer is protected by the clays of the Navarro Group and Taylor Group which are up to 800 feet thick and by strong artesian pressure (EA Engineering, Science, and Technology, 1992). Therefore, the potential for contamination in shallow soils reaching potable water supplies is extremely remote and the potential receptor exposure point most threatened by dissolved contamination in shallow groundwater flow from Site FC-2 and other industrial sites in Zone 2 is Leon Creek.

2.3 PREVIOUS SITE INVESTIGATIONS AND CONTAMINANT REMEDIATION

2.3.1 Site Investigations

2.3.1.1 1986 Radian Corporation Investigation

An initial site investigation was conducted by Radian Corporation in 1986 (Radian, 1988). As part of the investigation, Radian drilled three shallow soil borings (FC-2-1, FC-2-2, and FC-2-3) and collected soil samples from 1 to 2 feet bgs and 4 to 5 feet bgs in each boring. Soil samples were analyzed for volatile aromatics and halocarbons, and petroleum hydrocarbons. Radian then installed three monitoring wells, F201 (FT024MW001), F202 (FT024MW002), and F203 (FT024MW003), and collected two separate rounds of groundwater samples from these monitoring wells. Groundwater samples were analyzed for volatile aromatics and halocarbons, petroleum hydrocarbons, total metals, phenols, and other groundwater parameters. The findings of this investigation are included in the Phase II, Stage 2 report (Radian, 1988). Organic soil sample results from this investigation are presented in Table 2.1 and sampling locations are shown on Figure 2.2.

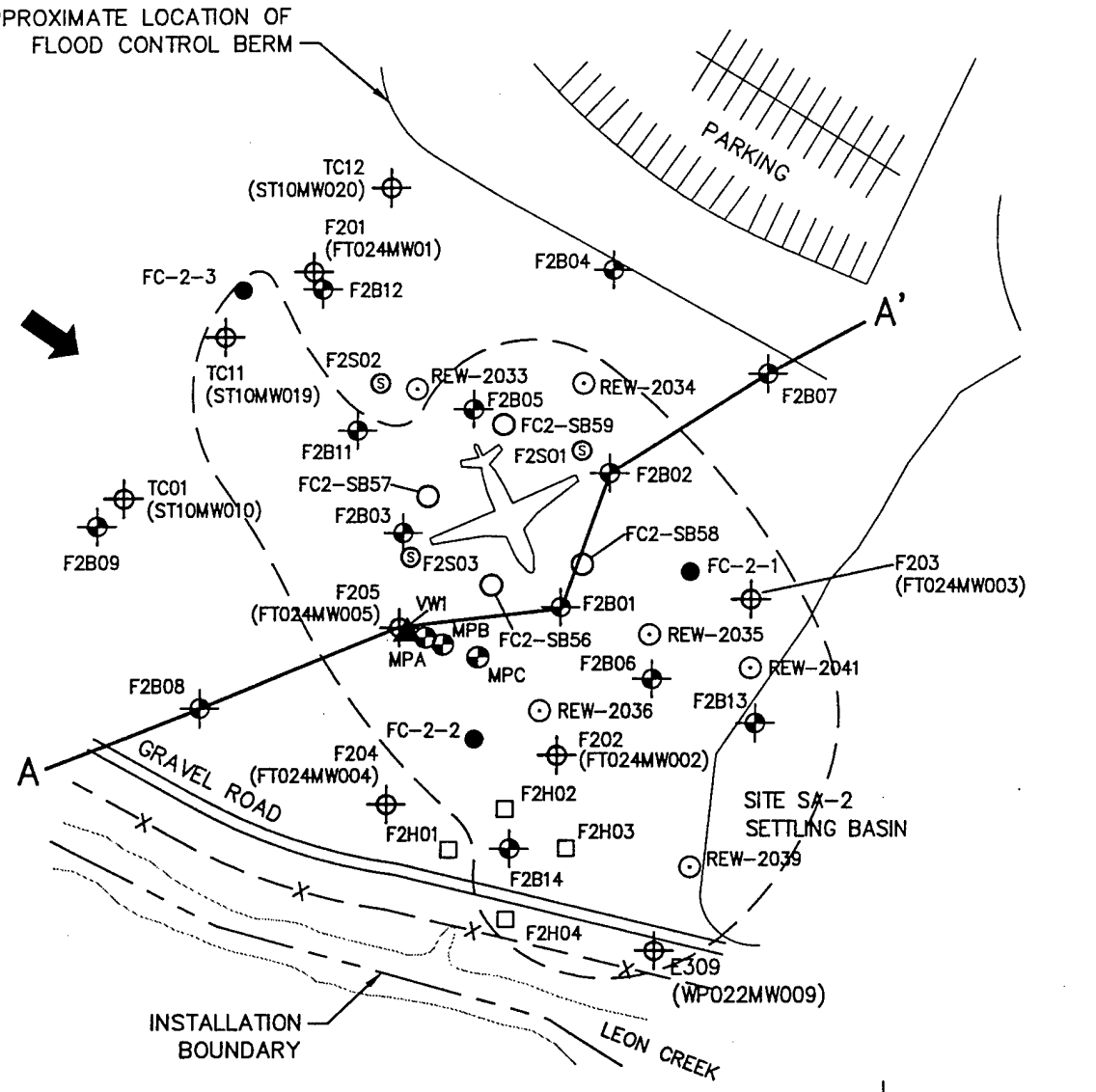


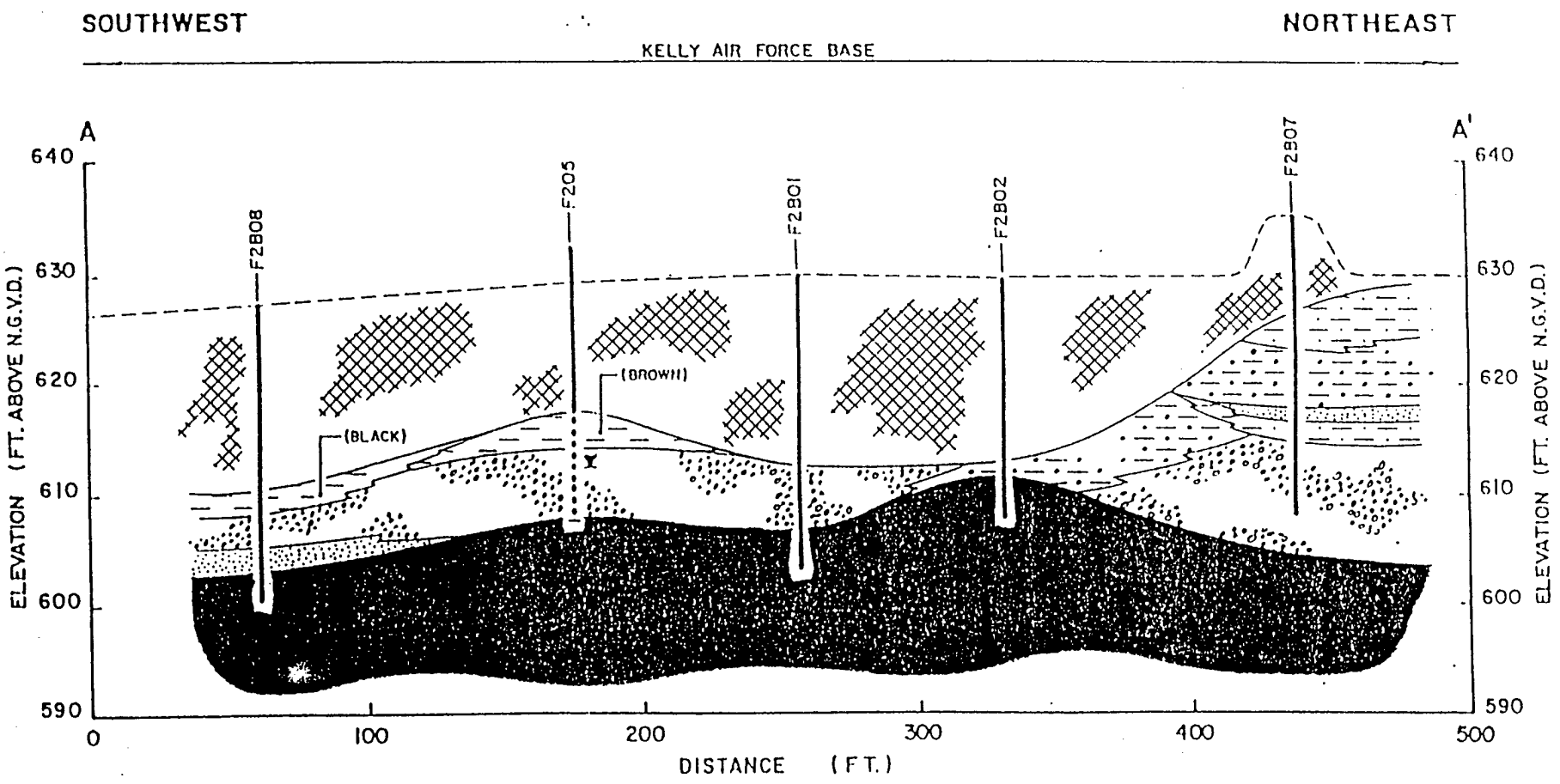
FIGURE 2.2

1992 ESTIMATED EXTENT OF SOIL CONTAMINATION

Site FC-2
Kelly AFB, Texas

PARSONS ENGINEERING SCIENCE, INC.
Denver, Colorado

S:\ES\cad\AFCEE\726876\KELLY\97DN1055, 03/23/98 at 12:42



Vertical Exaggeration = 4x Horizontal

LEGEND

- SAND
- GRAVEL
- FILL MATERIAL
- CLAYEY GRAVEL
- CLAY (BLACK)
- CLAY (BROWN)
- NAVARRO CLAY TRANSITION ZONE INT.
- NAVARRO CLAY

Source: Halliburton Nus, 1991.

FIGURE 2.3

GEOLOGIC CROSS SECTION A-A'

Site FC-2
Kelly AFB, Texas

PARSONS ENGINEERING SCIENCE, INC.
Denver, Colorado

TABLE 2.1
ORGANIC COMPOUNDS DETECTED IN SOIL
SITE FC-2
KELLY AFB, TEXAS

ANALYTE	SAMPLE ID[a]/SAMPLE DEPTH[b]									
	FC-2-1[R] 1-2	FC-2-1[R] 4-5	FC-2-2[R] 1-2	FC-2-2[R] 4-5	FC-2-3[R] 1-2	FC-2-3[R] 4-5	FC2-SB56[W] NA	FC2-SB57[W] NA	FC2-SB58[W] NA	FC2-SB59[W] NA
Total Petroleum Hydrocarbons (mg/kg)[c]	**10,000**	**400**	**250**	**1,300**	**1,800**	**320**	--[d]	--	--	--
Volatiles (mg/kg)										
Acetone	ND [e]	ND	ND	ND	ND	ND	**0.2**	**2.1B**[f]	**2.1B**	**0.5**
Benzene	ND	ND	ND	ND	ND	ND	<0.026[f]	<0.63	<0.72	<0.01
2-Butanone	ND	ND	ND	ND	ND	ND	<0.052	<1.3	<1.4	<0.02
Chlorobenzene	ND	ND	ND	ND	ND	ND	<0.026	<0.63	<0.72	<0.01
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	**0.011J**[b]	<0.63	<0.72	**0.01J**
Ethylbenzene	ND	ND	ND	ND	ND	ND	<0.026	<0.63	<0.72	<0.01
Methylene chloride	ND	ND	ND	ND	ND	ND	**0.026B**	**1B**	**0.52JB**	**0.67JB**
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	**0.023J**	<0.63	<0.72	<0.01
Trichloroethene	ND	ND	ND	ND	**0.016**	ND	**0.017J**	<0.63	**0.35J**	**0.016**
Toluene	ND	ND	ND	ND	ND	ND	**0.44J**	<0.63	**10**	**0.5J**
Xylenes	ND	ND	ND	ND	ND	ND	<0.026	<0.63	<0.72	<0.01
Semivolatiles (mg/kg)										
Acenaphthene	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
Anthracene	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
Benzo(a)anthracene	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
Benzo(b)fluoranthene	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
Benzo(a)pyrene	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
Benzo(g,h,i)perylene	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
Bis(2-ethylhexyl)phthalate	--	--	--	--	--	--	<0.38	**3.2**	<21	<0.41
Chrysene	--	--	--	--	--	--	**0.12J**	<2.0	<21	<0.41
Dibenzofuran	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
1,2-Dichlorobenzene	--	--	--	--	--	--	<0.026	**20**	<0.72	<0.05
1,4-Dichlorobenzene	--	--	--	--	--	--	<0.026	**3.3**	<0.72	<0.05
3,3-Dichlorobenzidine	--	--	--	--	--	--	<0.58	<2.9	<21	<0.61
Diethylphthalate	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
Di-n-butyl phthalate	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
Fluoranthene	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
Fluorene	--	--	--	--	--	--	**0.086J**	**0.23J**	<21	<0.41
Indeno(1,2,3-cd)pyrene	--	--	--	--	--	--	<0.38	<2.0	<21	<0.41
2-Methylnaphthalene	--	--	--	--	--	--	**0.12J**	**1.6J**	**5.6J**	<0.41
Naphthalene	--	--	--	--	--	--	<0.38	**0.86J**	<21	<0.41
Phenanthrene	--	--	--	--	--	--	**0.08J**	<2.0	<21	<0.41
Pyrene	--	--	--	--	--	--	**0.11J**	**0.4J**	<21	<0.41
1,2,4-Trichlorobenzene	--	--	--	--	--	--	<0.38	**0.6J**	<21	<0.41

TABLE 2.1 (CONTINUED)
ORGANIC COMPOUNDS DETECTED IN SOIL
SITE FC-2
KELLY AFB, TEXAS

ANALYTE	SAMPLE ID[a]/SAMPLE DEPTH[b]											
	F205[N] 13 - 15	F2B01[N] NA	F2B03[N] NA	F2B04[N] NA	F2B06[N] 5 - 7	F2B07[N] NA	F2B08[N] NA	F2B09[N] NA	F2B11[N] NA	F2B12[N] NA	F2B13[N] NA	F2B14[N] 2 - 4
Total Petroleum Hydrocarbons (mg/kg)[c]	2,300	290	9	32	960	160	160	270	<24	1,900	150	3,200
Volatiles (mg/kg)												
Acetone	0.31J	ND	ND	ND	0.73J	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	0.002J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	0.078J	0.011J	ND	ND	0.14J	ND	0.004J	0.018J	ND	ND	ND	ND
Chlorobenzene	ND	0.004J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.003J	ND	ND
Ethylbenzene	ND	0.002J	ND	ND	0.12	ND	ND	0.0009J	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	0.037
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.016
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	0.019	0.15	0.021	0.28D[b]	ND
Xylenes	ND	0.007	ND	ND	0.24	ND	ND	ND	ND	ND	ND	ND
Semivolatiles (mg/kg)												
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05J	ND	0.044J
Anthracene	ND	ND	ND	0.047J	ND	ND	ND	ND	ND	0.086J	ND	0.11J
Benzo(a)anthracene	ND	0.056J	ND	0.12J	0.045J	ND	0.073J	ND	ND	0.22J	ND	0.19J
Benzo(b)fluoranthene	ND	ND	ND	ND	0.077J	ND	0.13J	ND	ND	0.23J	ND	0.2J
Benzo(a)pyrene	ND	ND	ND	ND	0.04J	ND	0.069J	ND	ND	0.15J	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	0.054J	ND	0.13J	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	ND	ND	ND	ND	ND	ND	ND	ND	0.065J	0.082J	0.13J	ND
Chrysene	ND	0.063J	ND	0.14J	0.05J	0.023J	0.08J	ND	ND	0.21J	ND	0.24J
Dibenzofuran	0.17J	ND	ND	0.01J	ND	ND	ND	ND	ND	0.034J	ND	0.02J
1,2-Dichlorobenzene	ND	ND	ND	ND	0.18J	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	0.29J	ND	ND	ND	ND	ND	ND	ND
3,3-Dichlorobenzidine	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	ND	0.019J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	0.032J	ND	ND	ND	0.027J	ND	0.029J	ND	ND	ND	ND	ND
Fluoranthene	0.036J	0.087J	ND	0.21J	0.063J	ND	0.11J	ND	ND	0.39	ND	0.58
Fluorene	0.19J	ND	ND	ND	0.067J	ND	ND	ND	ND	0.075J	ND	0.055J
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	0.062J	ND	0.083J	ND	ND	ND	ND	ND
2-Methylnaphthalene	15D	ND	0.13J	ND	2.3	ND	ND	ND	ND	0.13J	ND	ND
Naphthalene	ND	0.024J	ND	ND	1.5	ND	ND	ND	ND	0.032J	ND	ND
Phenanthrene	0.099J	0.043J	ND	0.17J	0.086J	ND	0.077J	ND	ND	0.33J	ND	0.45
Pyrene	0.067J	0.084J	ND	0.26J	0.12J	0.026J	0.23J	ND	ND	0.39	ND	0.4
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 2.1 (CONTINUED)
ORGANIC COMPOUNDS DETECTED IN SOIL
SITE FC-2
KELLY AFB, TEXAS

ANALYTE	SAMPLE ID[a]/SAMPLE DEPTH[b]								
	F2S01[N] 0 - 4	F2S02[N] 0 - 4	F2S03[N] 0 - 4	REW-2033[G] NA	REW-2034[G] NA	REW-2035[G] NA	REW-2036[G] NA	REW-2039[G] NA	REW-2041[G] NA
Total Petroleum Hydrocarbons (mg/kg)[c]	3,100	610	4,600	--	--	--	--	--	--
Volatiles (mg/kg)									
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	0.005	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.054	ND	0.034	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND
Semivolatiles (mg/kg)									
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	ND	0.048J	ND	ND	ND	ND	ND	ND	ND
Benzo(a)anthracene	0.092J	0.16J	ND	ND	ND	ND	ND	ND	ND
Benzo(b)fluoranthene	ND	ND	ND	0.18	ND	0.303	0.088	0.538	2.182
Benzo(a)pyrene	ND	0.21J	ND	ND	ND	ND	ND	ND	ND
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis(2-ethylhexyl)phthalate	ND	0.063J	0.68J	ND	ND	ND	ND	ND	ND
Chrysene	ND	0.22J	0.15J	ND	ND	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	0.326	1.022	4.786	ND	ND	1.58
1,4-Dichlorobenzene	ND	ND	ND	0.12	0.241	4.023	ND	2.629	ND
3,3-Dichlorobenzidine	ND	0.015J	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butyl phthalate	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	0.19J	0.4	ND	ND	ND	ND	ND	ND	ND
Fluorene	ND	0.026J	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	0.333	3.134	3.255	5.58	1.98
Phenanthrene	ND	0.23J	ND	ND	ND	ND	ND	ND	ND
Pyrene	0.15J	0.24J	ND	0.049	0.584	0.125	ND	9.456	ND
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND

Note: All sample results above laboratory detection limit are shown in bold.

[a] Sample ID: R = Radian (1988); W = Weston (1990); N = NUS (1992); G = Wright (1995). Parsons ES soil data presented in Table 2.3.

[b] Sample depth in feet below ground surface based on available data; NA = sample depth not available.

[c] mg/kg = milligrams per kilogram.

[d] -- = sample not analyzed for this parameter.

[e] ND = sample not detected and detection limit not available.

[f] B = analyte found in associated blank as well as in sample.

[g] < = sample result is less than the laboratory reporting limit shown.

[h] J = indicates an estimated value. The compound was detected, but was below the laboratory reporting limit.

[i] D = dilution sample result.

Petroleum contamination was evident in both soil and groundwater samples. In surface soil samples collected from 1 to 2 feet bgs, total recoverable petroleum hydrocarbon (TRPH) contamination ranged from 250 to 10,000 milligrams per kilogram (mg/kg). Lesser TRPH contamination was evident in soil samples collected from 4 to 5 feet bgs (320 to 1,300 mg/kg). Trichloroethene (TCE) was detected in one shallow soil sample collected from FC-2-3 at 0.016 mg/kg. During groundwater sampling, a visible sheen of light non-aqueous phase liquid (LNAPL) was observed on the groundwater surface at monitoring well F202. During subsequent groundwater sampling performed by Radian, LNAPL was not observed in any of the three site monitoring wells, but toluene was detected at 97 micrograms per liter (μg/L) and 49 μg/L at monitoring wells F202 and F203, respectively. Other than chlorobenzene, which was detected at 30 μg/L and 12 μg/L in the groundwater samples from monitoring wells F202 and F203, respectively, relatively low levels of chlorinated VOCs were detected (0.17 to 2.9 μg/L). Lead concentrations detected in groundwater during the Radian investigation ranged from 0.036 to 0.27 milligrams per liter (mg/L) and may reflect the use of leaded fuels during fire training control exercises at the site.

2.3.1.2 1990 Roy F. Weston, Inc. Investigation

In 1990, Roy F. Weston, Inc. (1990) collected soil samples from four borings located near the center of the site (within 30 feet of the simulated airplane) and analyzed for VOCs and SVOCs. Sampled depths could not be determined using available boring logs or analytical data reporting sheets. Available soil sample results are presented in Table 2.1, and the soil boring locations are shown on Figure 2.2. Low levels of VOCs and SVOCs were detected in each soil boring. Noteworthy sample results included detections of bis(2-ethylhexyl)phthalate (3.2 mg/kg), 1,2-dichlorobenzene (20 mg/kg), and 1,4-dichlorobenzene (3.3 mg/kg) in the FC2-SB57 soil sample, and detection of TCE (0.35J mg/kg), toluene (10 mg/kg), and 2-methylnaphthalene (5.6J mg/kg) in the FC2-SB58 soil sample. Results of this investigation are presented in the IRP site characterization and permitting report for Sites E-3 and FC-2 (Weston, 1990).

2.3.1.3 1991 NUS Investigation

In 1991, NUS (1992) performed a soil gas survey, installed 2 permanent monitoring wells F204 (FT024MW004) and F205 (FT024MW005), drilled 13 soil borings (F2B01 to F2B09 and F2B11 to F2B14), completed 4 shallow hand-augered borings (F2H01 to F2H04), and collected 3 surface-soil samples (F2S01 to F2S03) to further delineate contamination at the site. Soil samples were analyzed for VOCs, SVOCs, total petroleum hydrocarbons (TPH), inorganics, and polychlorinated biphenyls (PCBs). VOCs and SVOCs were analyzed by field and fixed-based laboratory methods; unless otherwise noted, the sample results for these contaminants presented herein represent the fixed-base laboratory sample results. Organic compound soil sample results are presented in Table 2.1, and inorganic concentrations in soil are presented in Table 2.2. All sample results presented in Tables 2.1 and 2.2 represent soil samples collected above the water table within the vadose zone; the exact sampling depths for most of these sample results were not available. In addition, results for samples from borings F2B02 and F2B05 were not available. No PCBs were detected in any of the soil samples.

TABLE 2.2
METALS DETECTED IN SOIL
SITE FC-2
KELLY AFB, TEXAS

ANALYTE (mg/kg)[c/]	Indicator Value[d/]	SAMPLE ID[a/]/SAMPLE DEPTH[b/] F205 NA	F2B01 NA	F2B03 NA	F2B04 NA	F2B06 5-7	F2B07 NA	F2B08 NA	F2B09 NA	F2B11 NA	F2B12 NA	F2B13 NA	F2B14 NA	F2S01 NA	F2S02 NA	F2S03 NA
Aluminum	18,000	21,800	26,500	--[e/]	--	25,400	--	19,400	--	--	--	24,700	--	--	--	--
Barium	90	--	110	110	--	122	--	--	--	--	--	--	--	--	--	--
Beryllium	1.5	--	3.6	3.0	2.2	14.2	--	--	--	2.4	1.8	2.4	--	--	--	--
Cadmium	1.0	8.0J[f/]	1.8	1.9	3.5	4.6J	2.2J	3.4J	1.8J	3.3	1.5	2.8	--	--	--	--
Chromium	22	34J	23.5J	--	23.4J	33.7J	25.8J	24.8J	--	35.1J	22.2J	27.7J	--	--	22.5	--
Cobalt	8.0	--	9.7J	--	--	9.8J	--	--	--	--	--	--	--	--	--	--
Iron	38,000	--	--	--	--	46,200	--	--	--	--	--	--	--	--	--	--
Lead	12	57.6	13.7J	50.8J	52.3J	14.8	--	19.5	27.8	46.3	53.3	21.9	24.4	16	37	12
Manganese	520	--	--	--	--	757	--	--	--	--	--	--	--	--	--	--
Nickel	16	18J	16J	--	--	26.7J	19.4J	18.2J	--	--	--	17.7	--	--	21.2	--
Potassium	4,400	4,760J	4,610	--	--	4,460J	--	--	--	--	--	--	--	--	--	--
Silver	2.0	2.5	--	2.7	3.5	2.5	5.1	2.2	2.0	3.5	4.2	2.3	4.3	4.0	--	6.2
Sodium	450	--	--	650	--	494	--	--	--	--	--	--	--	--	--	--
Vanadium	48	--	--	--	--	51.5	--	--	--	--	--	--	--	--	--	--
Zinc	48	84.7J	62.9	64.9	50.6	69.1J	--	56J	52.7J	54.1	67.9	67.3	--	--	--	--

[a/] Source: NUS (1992).

[b/] Sample depth in feet below ground surface based on available data; NA = sample depth not available.

[c/] mg/kg = milligrams per kilogram.

[d/] Indicator value = twice the average background soil concentration (NUS, 1992).

[e/] -- = analyte not found above indicator value.

[f/] J = an estimated value. The compound was detected, but was below the laboratory reporting limit.

Ten VOCs were detected in soil samples collected by NUS at concentrations ranging from 0.0009 to 0.73 mg/kg. No VOCs, other than 1,1,1-trichloroethane (1,1,1-TCA) (0.054 mg/kg at F2S01 and 0.034 mg/kg at F2S03), were detected in any of the three surface soil samples that were collected in close proximity to the former burn area. Maximum concentrations of ethylbenzene (0.12 mg/kg) and xylenes (0.24 mg/kg) were detected in the soil sample from boring F2B06, and the maximum toluene concentration (0.28 mg/kg) was detected in the boring F2B13 soil sample. Benzene was only detected at F2B01, at an estimated concentration of 0.002 mg/kg. The extent of VOC contamination as determined by NUS was bounded to the north (borings F2B04 and F2B07) and to the southwest (borings F2B08) of the former fire control training area (Figure 2.2).

Twenty-one SVOCs were detected in vadose zone soil samples collected by NUS at concentrations ranging from 0.01 to 15 mg/kg. Most of the SVOCs detected at Site FC-2 had concentrations less than 0.2 mg/kg, and no SVOCs were detected in the soil sample collected from boring F2B09. Naphthalene and 2-methylnaphthalene were the only SVOCs detected above 1 mg/kg. In the soil sample collected 5 to 7 feet bgs at F2B06, 1.5 mg/kg of naphthalene and 2.3 mg/kg of 2-methylnaphthalene were detected. In the soil sample collected 13 to 15 feet bgs from boring F205, 2-methylnaphthalene was detected at 15 mg/kg. The four hand-augered soil borings (F2H01 through F2H04) were installed and shallow soil samples were collected and field analyzed for SVOCs because of numerous SVOCs detected at elevated concentrations in the 2 to 4 feet bgs soil sample from F2B14, located approximately 175 feet south of the simulated airplane. No SVOCs were detected above 2 mg/kg (the field laboratory detection limit) in any of the four hand-augered soil borings.

TPH contamination was evident in both shallow and deeper unsaturated soils at Site FC-2. Significant TPH concentrations were detected in surface soils near the simulated airplane/former fire training control area (3,100 mg/kg, 610 mg/kg, and 4,600 mg/kg were detected in surface soil samples F2S01, F2S02, and F2S03, respectively). In a shallow soil sample collected 2 to 4 feet bgs at F2B14, TPH was detected at 3,200 mg/kg. It was presumed by NUS (1992) that this high TPH concentration in shallow soil away from the simulated airplane, may have resulted from past fuel spills or fire training exercises not involving the airplane. Based on the TPH and SVOC results, NUS (1992) determined that a good correlation existed among the locations of these two types of soil contaminants; therefore, the areal extent of TPH contamination illustrated on Figure 2.2 (which also considers ES [1993] TPH results) also approximately delineates the areal extent of SVOCs at the site.

Fifteen inorganics were detected in soil samples at concentrations greater than twice the average background concentrations (NUS, 1992). Inorganic analytical soil sample results are presented in Table 2.2. Elevated concentrations of beryllium, cadmium, chromium, lead, nickel, silver, and zinc were detected at several locations across the site. Generally, the highest concentrations of inorganics detected at the site were from soil borehole F2B06, located approximately 120 feet southeast of the simulated airplane.

Groundwater sampling and dissolved contaminant analysis also was performed during the NUS investigation. Based on the NUS (1992) findings, relatively low levels of VOCs were detected in site monitoring wells. No VOC contamination was evident in upgradient monitoring wells F201, TC01 (ST10MW010), and TC12 (ST10MW020), or downgradient monitoring well E309 (WP022MW009). Also, no VOC contamination was evident in monitoring well F205 during the NUS sampling event. Chlorobenzene, 1,2-dichloroethene (1,2-DCE) (total), 1,1,1-TCA, and 1,2-dichloroethane (1,2-DCA) were the only VOCs detected in site groundwater, and their concentrations ranged from 1 to 8 μg/L. Contaminated soils within Site FC-2 may be the source of low-level chlorinated VOC contamination in Site FC-2 groundwater; however, groundwater concentrations 1,000 times those detected at Site FC-2 have been detected approximately 500 feet upgradient from Site FC-2 (NUS, 1992). SVOCs were detected in only two wells (F202 and TC01), with concentrations ranging from 1 to 10 μg/L.

2.3.1.4 1995 R.E. Wright Environmental Inc. Investigation

Additional soil samples were collected in August and September 1995 by R.E. Wright Environmental, Inc. (1995). A Geoprobe® sampler was used to further characterize soils at the site. Samples were analyzed using a portable gas chromatograph. Data presented in Table 2.1 from this investigation were obtained from a preliminary data report, and sampling depths were not available. Based on these data, elevated concentrations of SVOCs were detected in soil samples collected southeast of the simulated airplane (REW-2035, REW-2039, and REW-2041).

2.3.2 Parsons ES Bioventing Pilot and Extended Testing

In 1992, Site FC-2 was selected as a pilot test site for the AFCEE Bioventing Initiative Project. A pilot-scale system was installed in December 1992 by ES (1993) to assess the potential for air injection bioventing to remediate the hydrocarbon contamination identified in vadose zone soils. The primary objectives of the pilot test were: 1) to assess the potential for supplying oxygen throughout the contaminated soil profile; 2) to determine the rate at which indigenous microorganisms would degrade petroleum hydrocarbons when stimulated by oxygen-rich soil gas at this site; and 3) to evaluate the potential for sustaining these rates of biodegradation until hydrocarbon contamination is remediated below regulatory approved standards (ES, 1993).

The pilot test location and system configuration were based on site investigation data, which indicated that the highest TPH concentrations in vadose zone soils were located near monitoring well F205 (ES, 1993). The pilot-scale bioventing system consisted of one air injection vent well (VW1), three multi-depth soil gas monitoring points (MPA, MPB, and MPC), and one background soil gas monitoring point (MPBG) located approximately 300 feet northwest of the site near monitoring well TC-03. During installation of the pilot-scale system, groundwater was measured at approximately 15 feet bgs in the VW1 borehole and at nearby monitoring well F205. To ensure aeration of the entire vadose zone, VW1 was screened from approximately 7 to 17 feet bgs to allow for seasonal groundwater fluctuations. At each MP, screened intervals were placed at 4, 9, and 13.5 feet bgs. During installation of the pilot-scale system, soil and soil gas sampling, and respiration and soil-to-air permeability testing

were performed. Based on results of the oxygen influence and air permeability testing, the long-term radius of oxygen influence around VW1 exceeded 35 feet at all MP screened depths. A detailed description of the pilot-scale bioventing system design and initial testing results are provided in the Draft Interim Pilot Test Results Report (ES, 1993).

Following completion of pilot-scale bioventing system installation and testing, the system was started, optimized, and operated continuously from December 1992 until January 1994. The blower system was turned off 10 days prior to 1-year testing to allow vadose zone soil vapor contaminant concentrations to return to equilibrium conditions in order to compare initial and 1-year conditions. During the 1-year site visit, soil and soil gas samples were collected, and *in situ* respiration testing was performed. The blower system was restarted following testing to continue bioventing treatment of site soils. Initial and 1-year soil and soil gas sampling and *in situ* respiration testing results were provided by AFCEE (1994) to Kelly AFB.

Based on the positive results of the 1-year bioventing pilot test, Site FC-2 was included in the AFCEE Extended Bioventing program for system expansion (Option 4), 1-year of expanded system operation followed by soil gas sampling and respiration testing (Option 1), and confirmation soil sampling (Option 2). In support of the expanded-scale system design, additional soil gas sampling was performed by Parsons ES on 31 August 1995, to identify vadose zone soils in the site vicinity that were oxygen-depleted. At the time of this sampling event, the pilot-scale blower system had not been operating for several months because electrical fuses had been removed from the blower, allowing site soils and soil gas to return to equilibrium conditions. During this sampling event, mobile LNAPL was observed in monitoring well F202.

In January 1996, Parsons ES (1996a) installed the expanded bioventing system in accordance with the Final Remedial Action Plan (RAP) and expanded system design package. The expanded system, as shown on Figure 2.1, includes five additional VWs (VW2 through VW6) and three additional MPs (MPD, MPE, and MPF). In addition, the pilot-scale bioventing blower system was replaced with a larger blower, piping manifold, and shed. During system installation, soil samples were collected from the VW and MP boreholes, and following installation and prior to startup of the expanded system, soil gas samples were collected. The expanded bioventing system was started, optimized, and operated continuously for 1 year, following soil gas sampling. In February 1996, Parsons ES (1996b) provided AFCEE and Kelly AFB with as-built drawings and system operations and maintenance manuals for the Site FC-2 expanded-scale bioventing system.

Following 1 year of expanded bioventing system operation, Parsons ES was onsite during the week of 20 January 1997, to shut down the blower system in preparation for Option 1 soil gas sampling and respiration testing. Blower shutdown occurred approximately 1 month prior to testing to allow soil and soil gas at Site FC-2 to return to equilibrium conditions for comparison of 1-year expanded system monitoring results with previous monitoring results. Option 1 soil gas sampling and respiration testing was performed by Parsons ES during the week of 24 February 1997. Based on soil gas sampling and *in situ* respiration testing results from this site visit, it was recommended that the system remain in operation until May 1998 before conducting confirmation soil

sampling at Site FC-2. Expanded system soil and soil gas sampling and respiration testing results were provided by Parsons ES (1997) to AFCEE and Kelly AFB in a letter results report. Soil and soil gas sampling results and *in situ* respiration testing results from pilot-scale and expanded-scale bioventing system operation are summarized below.

2.3.2.1 Soil Sampling Results

Soil samples were collected during the installation of the pilot-scale bioventing system in December 1992 to determine baseline contaminant concentrations at the VW and MP locations, and again in January 1994, following 1 year of pilot-scale bioventing system treatment. During drilling, the greatest hydrocarbon contamination, identified based on visual appearance, odor, and VOC field screening results, was present in soils encountered between 10 and 15 feet bgs, particularly near the capillary fringe/water table. Based on field screening results, soil samples from 14 to 15 feet bgs at VW1, MPA, and MPB were sent to the ES Berkeley laboratory for analysis of TPH by US Environmental Protection Agency (USEPA) Method 418.1 and BTEX by USEPA Method SW8020. Initial and 1-year pilot-scale bioventing system soil sample results are presented in Table 2.3.

Soil TPH and BTEX concentrations were significantly reduced during the 1-year pilot-scale study. Average initial TPH levels were reduced from 1,627 mg/kg to 64 mg/kg in the three soil sampling locations tested, while BTEX concentrations were reduced by 1 to 4 orders of magnitude during the 1-year remediation period. These results indicated that air injection bioventing was an effective remediation technology for vadose zone soils contaminated with petroleum hydrocarbons, and supported bioventing system expansion at Site FC-2.

In January 1996, five soil samples were collected by Parsons ES during the installation of the expanded bioventing system and sent to Evergreen Analytical, Inc. in Wheat Ridge, Colorado for analysis of BTEX by USEPA Method SW8020, TPH by USEPA Method SW8015 (modified), and polynuclear aromatic hydrocarbons (PAHs) by USEPA Method SW8310. TPH and BTEX results from the January 1996 soil analyses are included in Table 2.3. TPH concentrations exceeding 1,000 mg/kg were detected at VW2 (14.5 feet bgs), MPD (8.5 feet bgs), and MPE (13 feet bgs), indicating the presence of significant fuel contamination in the site soils prior to expanded-scale bioventing system operation. VW6 was installed next to monitoring well F202 (which contained mobile LNAPL during the August 1995 sampling event), and a benzene concentration of 8.72 mg/kg was detected from the soil sample collected from 13 feet bgs at this location. No PAHs were detected at concentrations greater than the laboratory method detection limit of 3.3 mg/kg.

2.3.2.2 Soil Gas Sampling Results

Soil gas sampling was performed prior to, and following, 1 year of pilot-scale air injection bioventing, and again following 1 year of expanded-scale bioventing to determine relative changes in total volatile hydrocarbon (TVH), BTEX, and oxygen

TABLE 2.3
BIOVENTING SOIL ANALYTICAL RESULTS
SITE FC-2
KELLY AFB, TEXAS

Sampling Location[a/]	Sampling Date	Analyte[b/] TPH (mg/kg)[c/]	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
Pilot-Scale Bioventing System						
VW1(15)	Dec-92	280	<0.38[d/]	9.1	<0.31	11
	Jan-94	34.1	<0.0006	0.0056	<0.0006	0.0009
MPA(14)	Dec-92	3,500	<1.5	12	<1.2	40
	Jan-94	73.5	0.001	0.027	0.001	0.0059
MPB(14)	Dec-92	1,100	<0.38	2.9	<0.32	15
	Jan-94	83.8	<0.084	0.36	<0.084	<0.12
Expanded-Scale Bioventing System						
VW2(14.5)	Jan-96	1,022	0.0481	<0.01	<0.01	<0.01
VW6(13)	Jan-96	321	8.72	<0.2	0.74	1.36
MPD(8.5)	Jan-96	2,391	0.28	0.341	<0.1	0.773
MPE(13)	Jan-96	1,550	<0.002	<0.002	<0.002	<0.002
MPF(11.5)	Jan-96	111	<0.002	<0.002	<0.002	<0.002

[a/] Soil boring location with depth in feet below ground surface in parentheses.

[b/] Total petroleum hydrocarbons (TPH) analyzed by USEPA Method 418.1 during December 1992 and January 1994 sampling and by USEPA Method SW8015 (modified) during January 1996 sampling. BTEX analyzed by USEPA Method SW8020.

[c/] mg/kg = milligrams per kilogram.

[d/] < = Compound analyzed for, but not detected. Number shown represents the laboratory method detection limit.

concentrations. Soil gas sampling also was performed in August 1995 prior to bioventing system expansion. All available field and analytical soil gas results for the pilot-scale and expanded-scale bioventing system components are presented in Table 2.4.

Initial (December 1992) soil gas field-screening results at VW1, MPA, MPB, and MPC indicated depleted oxygen concentrations and high TVH concentrations, and suggested that air injection would oxygenate contaminated soils and enhance biodegradation of residual petroleum hydrocarbons. As can be seen from subsequent field-screening results presented in Table 2.4, static oxygen concentrations in soil gas generally increased and TVH concentrations generally decreased at VW1, MPA, and MPB. At MPB-9 and the two deeper MP screens at MPC (MPC-9 and MPC-13.5), little or no oxygen was detected in soil gas during the 2.5- and 3-year monitoring events. TVH concentrations remained relatively high at MPC-9 and MPC-13.5 during the first 3 years of monitoring.

Soil gas samples collected in January 1996 and February 1997 represent baseline and 1-year conditions, respectively, for the expanded-scale bioventing system. Low oxygen concentrations were evident at several site locations prior to expanded-scale bioventing, and at MPD-9, MPD-13.5 and monitoring well F202, high TVH concentrations also were evident. During the 1-year expanded air injection period, static oxygen concentrations in soil gas increased slightly at MPB-13.5, MPC-13.5, MPD-13.5, and MPE-4 with expanded bioventing system operation at the site, and more significantly at MPD-13.5, MPE-9, and MPE-13.5. February 1997 oxygen levels at MPA-9, MPA-13.5, MPB-4, MPB-9, MPC-4, MPD-4, MPF-4, MPF-9, VW3, VW4, VW5, and VW6 were lower than the January 1996 levels. Soil gas samples collected from MPA-13.5, MPB-9, MPC-9, and VW2 in February 1997 contained no oxygen.

The increases in soil gas oxygen are indicative of reduced microbial aerobic hydrocarbon biodegradation activity at these sample locations. Decreased oxygen levels at some points indicate the continued presence of fuel contamination, and that aerobic fuel biodegradation is still occurring at significant rates. The continued microbial activity has likely been induced by seasonal fluctuations in site groundwater, resulting in the smearing and adsorption of dissolved-phase contaminants onto site soils in the capillary fringe. Field-measured TVH was significantly reduced at all of the screened MP depths, including MPC-9 and MPC-13.5, following 1 year of expanded-scale bioventing system operation, which suggests that the majority of the fuel contamination remaining in site soils is biologically recalcitrant, and composed primarily of longer-chained, non-volatile hydrocarbons.

Soil gas samples for laboratory analysis were collected from site MPs prior to and following 1 year of pilot-scale and expanded-scale bioventing. Soil gas samples from all sampling events were sent to Air Toxics, Ltd. laboratory in Folsom, California, and analyzed for TVPH and BTEX by USEPA Method TO-3. The soil gas analytical results are presented in Table 2.4.

TABLE 2.4
BIOVENTING FIELD AND ANALYTICAL SOIL GAS RESULTS
SITE FC-2
KELLY AFB, TEXAS

Sample Location[a]	Sampling Event	Sampling Date	Field-Screening Data			Laboratory Data[d]				
			Oxygen (percent)	Carbon Dioxide (percent)	TVH[b] (ppmv)[c]	TVH (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethyl-benzene (ppmv)	Xylenes (ppmv)
Pilot-Scale Bioventing System Components										
VW1	Initial	Dec-92	0	1.9	1,300	4,200	14.0	7.4	7	5.4
	1-Year	Jan-94	NA[e]	NA	NA	2.0	<0.002[f]	0.02	0.01	0.029
	2.5-Year	Aug-95	6	10	1,300	--[g]	--	--	--	--
	3-Year	Jan-96	6.5	10	450	--	--	--	--	--
	4-Year	Feb-97	NA	NA	NA	--	--	--	--	--
MPA-4	Initial	Dec-92	2.7	7.2	28	--	--	--	--	--
	1-Year	Jan-94	NA	NA	NA	--	--	--	--	--
	2.5-Year	Aug-95	12	6	150	--	--	--	--	--
	3-Year	Jan-96	15	4	200	--	--	--	--	--
	4-Year	Feb-97	14	0.25	0	--	--	--	--	--
MPA-9	Initial	Dec-92	0	8.7	620	--	--	--	--	--
	1-Year	Jan-94	NA	NA	NA	--	--	--	--	--
	2.5-Year	Aug-95	6.5	10	200	--	--	--	--	--
	3-Year	Jan-96	9	9	200	--	--	--	--	--
	4-Year	Feb-97	5	1.4	0	--	--	--	--	--
MPA-13.5	Initial	Dec-92	0.3	8.4	1,500	16,000	58	20	24	19
	1-Year	Jan-94	NA	NA	NA	98	<0.004	0.28	0.093	0.29
	2.5-Year	Aug-95	0	16	1,200	--	--	--	--	--
	3-Year	Jan-96	10	3	450	--	--	--	--	--
	4-Year	Feb-97	0	3.5	0	--	--	--	--	--
MPB-4	Initial	Dec-92	12.8	2.7	24	--	--	--	--	--
	1-Year	Jan-94	NA	NA	NA	--	--	--	--	--
	2.5-Year	Aug-95	15	5	20	--	--	--	--	--
	3-Year	Jan-96	16	4.5	150	--	--	--	--	--
	4-Year	Feb-97	4	3	0	--	--	--	--	--
MPB-9	Initial	Dec-92	0	6.4	310	--	--	--	--	--
	1-Year	Jan-94	NA	NA	NA	--	--	--	--	--
	2.5-Year	Aug-95	0	14	600	--	--	--	--	--
	3-Year	Jan-96	1	12	300	--	--	--	--	--
	4-Year	Feb-97	0	3	1.4	--	--	--	--	--
MPB-13.5	Initial	Dec-92	0	5.4	760	--	--	--	--	--
	1-Year	Jan-94	NA	NA	NA	--	--	--	--	--
	2.5-Year	Aug-95	1.7	10	500	--	--	--	--	--
	3-Year	Jan-96	18	1	150	--	--	--	--	--
	4-Year	Feb-97	21	0	0	--	--	--	--	--
MPC-4	Initial	Dec-92	6.8	4	1,300	--	--	--	--	--
	1-Year	Jan-94	NA	NA	NA	--	--	--	--	--
	2.5-Year	Aug-95	11	7	150	--	--	--	--	--
	3-Year	Jan-96	17.5	2.5	100	--	--	--	--	--
	4-Year	Feb-97	10	4.5	0	--	--	--	--	--
MPC-9	Initial	Dec-92	0.3	8.2	1,700	--	--	--	--	--
	1-Year	Jan-94	NA	NA	NA	--	--	--	--	--
	2.5-Year	Aug-95	0	17	5,000	--	--	--	--	--
	3-Year	Jan-96	0	15	5,000	--	--	--	--	--
	4-Year	Feb-97	0	10.5	7.2	--	--	--	--	--
MPC-13.5	Initial	Dec-92	0.4	8.2	3,800	17,000	43	18	24	22
	1-Year	Jan-94	NA	NA	NA	200	<0.025	1.5	0.35	0.71
	2.5-Year	Aug-95	0	17	4,000	--	--	--	--	--
	3-Year	Jan-96	0	15	>10,000[h]	--	--	--	--	--
	4-Year	Feb-97	1	12.5	0	130	<0.003	0.66	0.13M[U]	0.24M

TABLE 2.4 (Continued)
BIOVENTING FIELD AND ANALYTICAL SOIL GAS RESULTS
SITE FC-2
KELLY AFB, TEXAS

Sample Location[a/]	Sampling Event	Sampling Date	Field-Screening Data			Laboratory Data[d/]				
			Oxygen (percent)	Carbon Dioxide (percent)	TVH[b/] (ppmv)[c/]	TVH (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethyl-benzene (ppmv)	Xylenes (ppmv)
Expanded-Scale Bioventing System Components										
MPD-9	Initial	Jan-96	4	5	1,100	--	--	--	--	--
	1-Year	Feb-97	6.5	10.5	29.8	--	--	--	--	--
MPD-13.5	Initial	Jan-96	0	15	5,000	6,300	37	5.2	1.4	3.2
	1-Year	Feb-97	6	10.5	596	7,600	<0.33	30	1.6	3.8M
MPE-4	Initial	Jan-96	15	5	20	14	0.005	0.009	0.003	0.12
	1-Year	Feb-97	16	3	10.1	--	--	--	--	--
MPE-9	Initial	Jan-96	4	8.5	40	170	0.21	0.22	<0.18	0.43
	1-Year	Feb-97	15	3.5	3.5	--	--	--	--	--
MPE-13.5	Initial	Jan-96	1	14	8	110	0.067	0.13	<0.022	1.1
	1-Year	Feb-97	15	6	3	4.1	<0.002	0.010M	<0.002	<0.002
MPF-4	Initial	Jan-96	19	1.5	40	--	--	--	--	--
	1-Year	Feb-97	13	0.75	0	--	--	--	--	--
MPF-9	Initial	Jan-96	5	8.5	100	--	--	--	--	--
	1-Year	Feb-97	2.5	7	0.4	--	--	--	--	--
MPF-13.5	Initial	Jan-96	NS	NS	NS	--	--	--	--	--
	1-Year	Feb-97	16	3	13.5	--	--	--	--	--
VW2	Initial	Jan-96	0	13	400	--	--	--	--	--
	1-Year	Feb-97	0	0.5	208	--	--	--	--	--
VW3	Initial	Jan-96	5.5	11	400	--	--	--	--	--
	1-Year	Feb-97	1	0.05	12.2	--	--	--	--	--
VW4	Initial	Jan-96	14	11	900	--	--	--	--	--
	1-Year	Feb-97	9	0.8	0	--	--	--	--	--
VW5	Initial	Jan-96	16	4	300	--	--	--	--	--
	1-Year	Feb-97	7	0.05	0	--	--	--	--	--
VW6	Initial	Jan-96	13	7	500	--	--	--	--	--
	1-Year	Feb-97	10.5	9.25	3.4	5.4	<0.002	0.024	0.002	0.004
Site Monitoring Wells										
F202	Initial	Aug-95	FP[j/]	FP	FP					
	Initial	Jan-96	1.5	16	6,000	--	--	--	--	--
	1-Year	Feb-97	NS	NS	NS	--	--	--	--	--
F203	Initial	Jan-96	0	13	500	--	--	--	--	--
	1-Year	Feb-97	NS	NS	NS	--	--	--	--	--
F204	Initial	Aug-95	11.5	9	150					
	Initial	Jan-96	15.5	4.5	300	--	--	--	--	--
	1-Year	Feb-97	NS	NS	NS	--	--	--	--	--
F205	Initial	Aug-95	0	13	3,000					
	1-Year	Feb-97	NS	NS	NS	--	--	--	--	--

[a/] Monitoring point sample (screen) depth in feet below ground surface provided as appropriate.

[b/] TVH = total volatile hydrocarbons.

[c/] ppmv = parts per million, volume per volume.

[d/] Laboratory analysis of soil gas performed using USEPA Method TO-3.

[e/] NA = not available.

[f/] < = compound analyzed for, but not detected. Number shown represents the laboratory method detection limit.

[g/] -- not analyzed.

[h/] > = concentration greater than maximum reading on Gas-Tech® Trace Techtor hydrocarbon analyzer.

[i/] M = reported value may be biased due to apparent laboratory matrix interferences.

[j/] FP = free product detected in monitoring well during sampling event.

Following 1 year of expanded-scale bioventing system operation, benzene concentrations at MPD-13.5 and MPE-13.5 decreased to non-detect levels. Concentrations of toluene, ethylbenzene, xylenes, and TVH decreased slightly in MPE-13.5, but increased in MPD-13.5 over the same time period. Prior to startup of the pilot-scale bioventing system in December 1992, laboratory TVH and total BTEX soil gas concentrations at MPC-13.5 were 17,000 parts per million, volume per volume (ppmv) and 107 ppmv, respectively (ES, 1993). As a result of pilot-scale bioventing system operation and one additional year of expanded-scale bioventing system operation, soil gas TVH and total BTEX concentrations at MPC-13.5 have been reduced by two orders of magnitude to non-detect or very low levels. While benzene concentrations in soil prior to expanded-scale bioventing appeared to be significant at VW6 (Table 2.3), no benzene was detected in the 1-year soil gas sample collected from this location.

2.3.2.3 Respiration Test Results

Observed *in situ* microbial respiration (oxygen utilization) rates have decreased significantly as a result of pilot-scale and expanded-scale bioventing system operation at Site FC-2. As can be seen from the results presented in Table 2.5, significant reductions occurred in both respiration and fuel biodegradation rates following the first year of pilot-scale bioventing system operation. At MPB-9, oxygen utilization rates and the corresponding fuel biodegradation rates decreased steadily during operation and monitoring of the pilot-scale bioventing system (December 1992 to January 1994), although respiration testing performed in February 1997 indicates rates increased slightly after 1 year of expanded system operation. Oxygen utilization and fuel biodegradation rates have decreased steadily at MPC-13.5 since bioventing system operation began in December 1992.

With the exception of VW2, oxygen utilization rates remained relatively high during the February 1997 respiration testing event, indicating that aerobic biodegradation of petroleum hydrocarbons in vadose zone soils continued to be enhanced by the introduction of oxygen. Oxygen utilization and fuel biodegradation rates typically decrease with continued bioventing as the lighter, more readily biodegraded hydrocarbons are preferentially destroyed over more biologically recalcitrant, higher-molecular-weight hydrocarbons. Respiration testing results following 1 year of expanded bioventing system operation indicated that significant levels of fuel hydrocarbons remained in subsurface soils at Site FC-2. However, the soil gas analytical data suggested that more easily biodegraded BTEX compounds had been reduced to relatively insignificant concentrations in site soils.

2.3.2.4 Recommendations Following 1-Year of Expanded Bioventing

Results of soil gas sampling and respiration testing performed in February 1997 indicated that soils return to anoxic conditions following system shutdown and significant hydrocarbon biodegradation would continue to occur with ongoing bioventing (oxygenation) of site soils. While respiration results indicated that

TABLE 2.5
RESPIRATION AND BIODEGRADATION RATES
SITE FC-2
KELLY AFB, TEXAS

Location-Depth	Initial (December 1992)[a/]		6-Month (June 1993)[b/]		1-Year (January 1994)[c/]		Expanded System Operation[d/]	
	Respiration Rate (% O_2/min)[e/]	Degradation Rate (mg/kg/year)[f/]	Respiration Rate (% O_2/min)	Degradation Rate (mg/kg/year)	Respiration Rate (% O_2/min)	Degradation Rate (mg/kg/year)	Respiration Rate (% O_2/min)	Degradation Rate (mg/kg/year)
MPA-13.5	0.04	8,100	0.013	2,600	0.0058	1,200	NM [g/]	NM
MPB-9	0.021	3,500	0.0039	480	0.0023	180	0.0074	780
MPB-13.5	0.025	4,200	0.0019	230	0.0083	650	NM	NM
MPC-13.5	0.04	6,700	0.029	3,600	0.022	1,700	0.0073	790
MPD-9	NM	NM	NM	NM	NM	NM	0.013	1,270
MPD-13.5	NM	NM	NM	NM	NM	NM	0.012	1,560
VW2	NA[h/]	NA	NA	NA	NA	NA	0.0064	90

[a/] Rates prior to startup of the pilot-scale bioventing system.

[b/] Rates following 6 months of pilot-scale bioventing system operation.

[c/] Rates following 1 year of pilot-scale bioventing system operation.

[d/] Test performed in February 1997 after 1 year of expanded bioventing system operation.

[e/] % O_2/min = percent oxygen per minute.

[f/] mg/kg/year = milligrams of hydrocarbons per kilogram of soil per year.

[g/] NM = not measured.

[h/] NA = not applicable; VW2 was not installed until January 1996.

aerobically biodegradable fuel components were still present in vadose zone soils, soil gas results indicated that BTEX (the most mobile and toxic fuel components) concentrations in soil had been reduced considerably during the first year of expanded-scale bioventing system operation. As recommended in the Option 1 letter report (Parsons ES, 1997), the blower system at Site FC-2 has continued to operate since February 1997 to further remediate residual VOCs and SVOCs in vadose zone soils and reduce the potential for organic contaminant transport to groundwater and migration to Leon Creek.

2.3.3 Groundwater Remediation

In accordance with the FS for Zone 2 soils (Halliburton NUS, 1997), groundwater interim actions have been implemented within Zone 2 to actively prevent impacted groundwater from reaching Leon Creek. These actions include a combined pump-and-treat system with extraction wells at Site IWTP and three other IRP sites within Zone 2. Groundwater is extracted at each of these locations and treated using ultraviolet oxidation. Groundwater in Zone 2 is managed and regulated as a separate OU, independent of Zone 2 soils.

SECTION 3

SOIL CLEANUP REQUIREMENTS

3.1 SITE CHARACTERIZATION REQUIREMENTS

The objective of the confirmation soil sampling is to support an Air Force NFRAP decision for the soils contaminated with organic constituents in the immediate vicinity of the former fire training control area, pursuant to closure of IRP Site FC-2 in Zone 2, soil OU3. This SAP targets only unsaturated soils above the groundwater table; groundwater contamination for Zone 2 is considered under a separate OU, and groundwater cleanup requirements are not addressed in this plan.

3.2 SOIL CLEANUP STANDARDS

For IRP Site FC-2, guidance for site closure is provided in 30 TAC Subchapter S, Section 335, regarding sites contaminated with industrial solid waste and/or municipal hazardous waste. At these sites, a risk-based approach has been adopted by the TNRCC for determining the extent and type of remediations and closures that are necessary to protect human health and the environment. The approach utilizes three remediation/closure performance standards to satisfy cleanup requirements at contaminated facilities and areas (Risk Reduction Standards 1, 2, and 3). Each of the three standards is designed to provide long-term protection of human health and the environment through varying degrees of post-closure care and deed recordation, depending upon the level of remediation achieved. The regulations establish generic cleanup levels that can be used to attain cleanup criteria for Risk Reduction Standard 1 and Standard 2 closures. An overview of the three Risk Reduction Standards is provided in the following subsections.

3.2.1 Overview of Risk Reduction Standards

3.2.1.1 Risk Reduction Standard 1

Risk Reduction Standard 1 requires a responsible person to remove and/or decontaminate all waste, waste residues, leachate, and contaminated media to background levels unaffected by waste management or industrial activities. Through removal, the waste materials and contaminated media can be transported off site for treatment and/or disposal. Through decontamination, the contaminated material can be treated to destroy or eliminate its hazardous properties. No post-closure care or deed recordation is required under site closures that comply with this standard.

3.2.1.2 Risk Reduction Standard 2

Risk Reduction Standard 2 requires a responsible person to remove and/or decontaminate all waste, waste residues, leachate, and contaminated media to health-based standards and criteria such that any substantial current or future threat to human health or the environment is eliminated. Site closure under this standard is designed to provide a permanent remedy with a high degree of risk reduction.

While the risk reduction is somewhat less than that achieved under Standard 1, Standard 2 is also favored by TNRCC. This standard requires the use of irreversible processes of removal and decontamination to restore a site to protective levels. These protective levels are derived either by quantitative health-based risk assessment procedures, or by directly using other appropriate promulgated standards. Risk Reduction Standard 2 establishes separate cleanup levels for residential and nonresidential use of contaminated properties.

Under Risk Reduction Standard 2 rules, the responsible party is released from all post-closure responsibilities, such as groundwater monitoring. However, a deed certification requirement is imposed to ensure future prospective owners are informed of any residual levels of contaminants remaining on the property.

3.2.1.3 Risk Reduction Standard 3

Risk Reduction Standard 3 requires a responsible person to remove, decontaminate, and/or control all waste, waste residues, leachate, and contaminated media to levels and in a manner such that any substantial present or future threat to human health or the environment is eliminated or reduced to the maximum extent practicable. This standard may be used under circumstances where closure or remediation strictly by removal or decontamination is not feasible and allows the use of control measures for the contaminated material and/or property. Such measures may consist of engineering controls such as construction of a fence, placement of a cap, installation of a slurry wall, or stabilization/solidification/fixation of the waste or waste residues. Institutional controls, which include deed restrictions, also may be necessary.

Under this standard, the responsible party uses removal and decontamination processes where feasible to remove the principal threats at a site. Where decontamination or removal is not appropriate, then treatment methods that significantly reduce the mobility, toxicity, and/or volume of the waste can be used to address the principal site threats. Remedies conforming to this standard must be permanent, or if that is not achievable, must attain the highest degree of long-term effectiveness possible. Therefore, the responsible party has the burden of demonstrating that the removal, decontamination, and/or control measures chosen represent the optimum measures for eliminating or abating present and future threats to human health and the environment to the maximum practicable extent. A baseline risk assessment and a corrective measure study typically are required for sites to be closed under Risk Reduction Standard 3.

Due to the potentially reversible nature of control measures, as opposed to removal or decontamination of wastes and waste residues as described for Risk Reduction

Standards Nos. 1 and 2, post-closure care is required for sites closed under Standard 3. In addition, deed recordation is required under this standard that states that continued post-closure care or institutional control measures are required to protect human health and the environment.

3.2.1.4 Risk Reduction Standards for Site FC-2

Based on the nature and extent of contamination at Site FC-2, it is unlikely that all contaminants can be removed/decontaminated to background levels as required in Risk Reduction Standard 1; therefore, the eventual closure of IRP Site FC-2 will likely have to comply with Risk Reduction Standard 2 or 3, or some combination thereof. Considering the delineation of operable units at Kelly AFB based on contaminant type and media, and the fact that Site FC-2 represents portions of OU3 (organics) and OU4 (inorganics) and is not separately regulated, the objective of the confirmation sampling as proposed in this SAP is to demonstrate that VOCs and SVOCs have been sufficiently reduced through air injection bioventing to meet Risk Reduction Standard 2 requirements. However, other site contaminants (e.g., inorganics) likely will have to be addressed further, and as outlined in the FS for Zone 2 soils (Halliburton NUS, 1997), control measures and land-use restrictions may be necessary for soil OU4 (including the southeastern quarter of Site FC-2) that are more consistent with Risk Reduction Standard 3.

3.2.2 Cleanup Criteria

3.2.2.1 Organics in Soil

Confirmation soil sample results will be compared to cleanup criteria established by TNRCC to demonstrate that organic contaminants in site soils have been sufficiently remediated to meet the requirements of Risk Reduction Standard 2. Specifically, medium specific concentrations (MSCs) as established by the State of Texas (30 TAC Subchapter S, Section 335.568, Appendix II) will be used as the cleanup criteria. The MSCs represent numeric cleanup levels in contaminated media considering various human exposure routes (ingestion and inhalation) and cross-media contamination of air and groundwater from contaminated soils. Separate MSCs have been established for industrial and residential land-use scenarios. While current and projected future land-use scenarios for Site FC-2 and its vicinity are industrial in nature, residential MSCs have initially been chosen as cleanup criteria for IRP Site FC-2 because of the close proximity of Leon Creek and the potential impact of contaminant migration from soils to groundwater, followed by dissolved contaminant transport to Leon Creek.

Table 3.1 compares the maximum detected site soil concentrations of VOCs and SVOCs prior to bioventing treatment of site soils to State of Texas MSCs for residential and industrial land use. The residential groundwater protective MSCs represent concentrations in residential soil assumed to be protective of underlying groundwater considering cross-media contamination of groundwater from contaminated soil. In accordance with State of Texas requirements for residential soils (30 TAC Subchapter S, Section 335.559), the concentration of a contaminant throughout the soil column (i.e., surface and subsurface soils) shall not exceed the lower of the soil MSC, based upon residential human ingestion of soil and inhalation of particulates and volatiles, and

the residential soil-to-groundwater cross-media protection MSC. Only the groundwater-protective MSCs are presented in Table 3.1 because they represent the most conservative (lowest) soil MSCs. For comparison purposes, groundwater-protective standards for industrial land use also are presented. With the exception of the criteria for acetone and 2-butanone, the residential and industrial groundwater-protective MSCs are the same for all VOCs that have been detected in site soils. Generally, the groundwater-protective MSCs for industrial soils are higher than the residential MSCs for the SVOCs, because of the decreased mobility of these contaminants in the subsurface environment.

For those SVOC soil contaminants for which generic MSCs have not been established in 30 TAC, Subchapter S, Section 335.568, Appendix II (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, chrysene, 3,3-dichlorobenzidine, indeno(1,2,3-cd)pyrene, and 2-methylnaphthalene), MSCs will be derived as necessary, in accordance with 30 TAC, Subchapter S, Section 335.567, Appendix I, to compare against confirmation sampling results.

Comparing the pre-bioventing maximum detected site concentrations of organics to the Risk Reduction Standard 2 cleanup criteria indicates that site contaminant levels following more than 2 years of pilot-scale and 2 years of expanded-scale bioventing treatment of site soils are likely to meet the cleanup criteria. Of the thirty-three VOCs and SVOCs detected in site soils, only benzene, methylene chloride and bis(2-ethylhexyl)phthalate were present in site soils at concentrations that exceeded these criteria prior to initiation of bioventing soil treatment. While the volatile BTEX compounds are highly susceptible to bioventing treatment (Hinchee *et al.*, 1992; Ratz *et al.*, 1997), less volatile PAHs, including benzo(b)fluoranthene, benzo(a)pyrene, and bis(2-ethylhexyl)phthalate also are susceptible to bioventing (Leeson and Hinchee, 1995) and have been successfully treated (Lund et al., 1991; Hinchee and Ong, 1992; Alleman et al., 1995). While biodegradation of methylene chloride is not typically enhanced by bioventing, potentially elevated concentrations of this contaminant in site soils would likely have been reduced through volatilization (because of its high vapor pressure) during air injection bioventing. However, it should be noted that the maximum detected site concentration of methylene chloride (1 mg/kg) may be an artifact of laboratory sample analysis, as methylene chloride was also detected in the associated sample blank.

Maximum detected concentrations of each VOC and SVOC from the confirmation soil sampling initially will be compared to the cleanup criteria in Table 3.1. If the maximum detected concentration of a VOC or SVOC exceeds its respective cleanup level, the 95-percent upper confidence limit (UCL) on the mean concentration of the contaminant will be calculated and compared to the cleanup level. For this comparison, the soil contaminant concentration (95-percent UCL) remaining in site soil will be considered acceptable (in compliance with Risk Reduction Standard 2) if it is less than its respective cleanup level. For a data set of 10 or more samples, the 95-percent UCL on the mean can be calculated and compared to site cleanup levels based on the following expression:

TABLE 3.1
PRE-BIOVENTING ORGANIC SOIL CONTAMINANT LEVELS COMPARED TO CLEANUP CRITERIA
SITE FC-2
KELLY AFB, TEXAS

Analyte	Maximum Detected Site Concentration[a] (mg/kg)[b]	TAC MSC's[c] Groundwater-Protective Industrial[d] (mg/kg)	TAC MSC's[c] Groundwater-Protective Residential[e] (mg/kg)
TRPH[f]	10,000	NA[g]	NA
Volatile Organics			
Acetone	2.1B[h]	1,020	365
Benzene	8.72	0.5	0.5[i]
2-Butanone	0.14J[j]	511	183
Chlorobenzene	0.004J	10	10
1,2-Dichloroethene (total)	0.011J	7[k]	7[k]
Ethylbenzene	0.74	70	70
Methylene chloride	1B	0.5	0.5
Toluene	12	100	100
1,1,1-Trichloroethane	0.054	20	20
Trichloroethene	0.35J	0.5	0.5
Xylenes	40	1,000	1,000
Semivolatile Organics			
Acenaphthene	0.05J	613	219
Anthracene	0.11J	3,070	1,100
Benzo(a)anthracene	0.22J	Calc.[l]	Calc.
Benzo(b)fluoranthene	2.182	Calc.	Calc.
Benzo(a)pyrene	0.21J	Calc.	Calc.
Benzo(g,h,i)perylene	0.13J	Calc.	Calc.
Bis(2-ethylhexyl)phthalate	3.2	2.04	0.598
Chrysene	0.24J	Calc.	Calc.
Dibenzofuran	0.17J	Calc.	Calc.
1,2-Dichlorobenzene	20	60	60
1,4-Dichlorobenzene	4.023	7.5	7.5
3,3-Dichlorobenzidine	0.015J	Calc.	Calc.
Diethylphthalate	0.019J	8,180	2,920
Di-n-butyl phthalate	0.032J	1,020	365
Fluoranthene	0.58	409	146
Fluorene	0.23J	409	146
Indeno(1,2,3-cd)pyrene	0.083J	Calc.	Calc.
2-Methylnaphthalene	15D[m]	Calc.	Calc.
Naphthalene	5.58	409	146
Phenanthrene	0.45	Calc.	NA
Pyrene	9.456	310	110
1,2,4-Trichlorobenzene	0.6J	7	7

[a] Maximum detected site concentrations from soil samples collected prior to air injection bioventing treatment.

[b] mg/kg = Milligrams per kilogram.

[c] 30 Texas Administrative Code (TAC), Subchapter S, Section 335.568, Appendix II, medium-specific concentrations (MSCs).

[d] Concentration in industrial soil assumed protective of groundwater considering cross-media contamination of groundwater from contaminated soil.

[e] Concentration in residential soil assumed protective of groundwater considering cross-media contamination of groundwater from contaminated soil.

[f] TRPH = Total recoverable petroleum hydrocarbons.

[g] Not applicable.

[h] B = Analyte also found in associated laboratory sample blank.

[i] Shading indicates that the cleanup criterion value for the analyte is exceeded by the pre-bioventing maximum site concentration.

[j] J = Analtye detected, but below the laboratory reporting limit. Value shown is the laboratory-estimated concentration.

[k] TAC MSC value for *cis*-1,2-dichloroethene which has the more conservative cleanup level considering the two 1,2-dichloroethene isomers.

[l] Calc. = MSC for this analyte will be derived in accordance with 30 TAC, Subchapter S, Section 335.567, Appendix I, if detected during confirmation sampling.

[m] D = Laboratory dilution sample result.

$$\text{Cleanup level} \geq x + ts/\sqrt{n}$$

Where: x = the mean concentration,

s = the standard deviation,

t = a value from a one-sided Student's t distribution based on the number of samples (available in Table 2 of 30 TAC, Subchapter S, Section 335.553),

$\sqrt{n}$ = the square root of the sample size.

Depending on the distribution of the contaminant data, other statistical methods may be more appropriate for estimating the site concentration for comparison to the cleanup criteria; the acceptability of other such methods, if necessary, will be verified with the TNRCC prior to use in the confirmation report.

3.2.2.2 Inorganics in Soil

As previously mentioned, the objective of confirmation sampling soil sampling as proposed in this SAP is to support an NFRAP decision for the soils contaminated with organic constituents at IRP Site FC-2. Bioventing targeted petroleum hydrocarbon contamination in site vadose zone soils, and is not an effective remediation technique for inorganics. Inorganics likely remain in site soils at concentrations similar to those detected by NUS (1992) (Table 2.2).

3.2.2.3 Post Closure Care and Deed Certification

Post-closure care and deed certification requirements for IRP Site FC-2 will depend upon the cleanup criteria or Risk Reduction Standard(s) under which soil OU3 and soil OU4 at IRP Site FC-2 are eventually closed. These requirements, which were briefly described for Risk Reduction Standards 2 and 3 (Sections 3.2.1.2, and 3.2.1.3, respectively) may vary significantly depending upon the final closure remedy and whether engineering controls and/or institutional controls are necessary to address inorganics at the site. It is anticipated that VOC and SVOC contaminant concentrations in site soils will comply with Risk Reduction Standard 2, requiring only deed certification (i.e., no post-closure care).

SECTION 4

SITE CONFIRMATION SOIL AND GROUNDWATER SAMPLING AND ANALYSIS PLAN

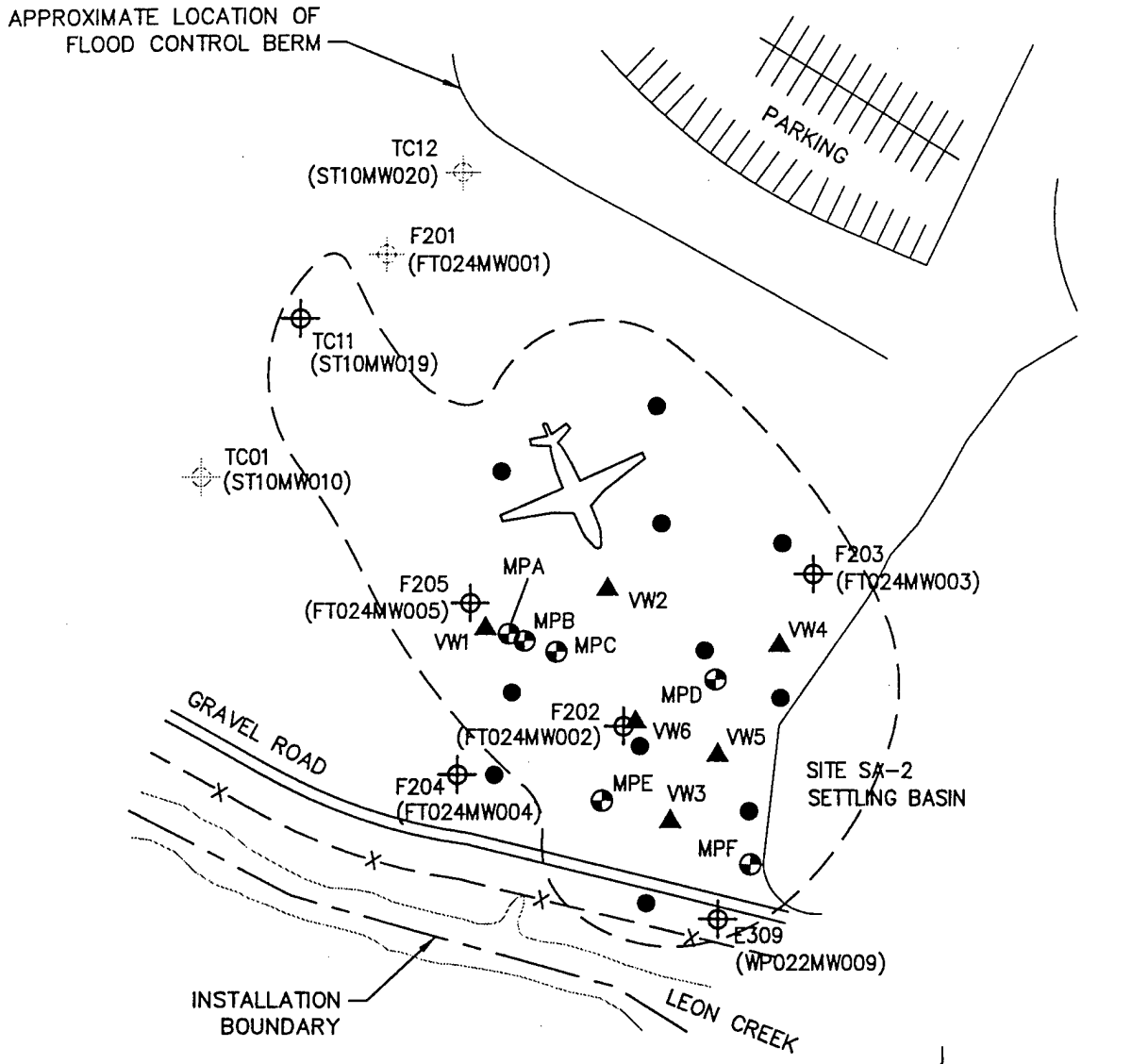
The following SAP describes the borehole locations, sampling depths, soil sampling procedures, and analytical methods proposed to collect sufficient data to verify remediation of organic contaminants in soil at IRP Site FC-2 to proposed cleanup levels (Table 3.1), and to support site closure. In addition, limited groundwater sampling for BTEX, chlorinated VOCs, and various geochemical parameters is included in the SAP in order to document the nature and extent of dissolved contamination, and the applicability of remediation by natural attenuation for the organic contaminants in the vicinity of Site FC-2.

As described in Section 2, soil contamination at Site FC-2 was characterized during the 1986 through 1995 investigations. In addition, analytical results from limited soil sampling conducted following approximately 1 year of pilot-scale bioventing system operation, and soil gas sampling and respiration testing results following approximately 1 year of expanded-scale bioventing system operation indicated substantial reductions in soil BTEX and TPH concentrations. Soil sample results collected during previous bioventing installation and investigation activities indicate that petroleum hydrocarbon contamination at the site is most significant above the water table in the capillary fringe (smear-zone) southeast of the simulated airplane toward Leon Creek. Because Leon Creek represents the primary receptor exposure point potentially impacted by soil contamination and migration of dissolved contaminants in groundwater, confirmation soil sampling as described in this section will be concentrated in the vicinity of former fire training control exercises (simulated airplane) and downgradient from this area toward Leon Creek.

4.1 SOIL SAMPLING

This section describes the scope of work required for collecting confirmation soil samples at Site FC-2. An estimated eleven boreholes will be drilled and sampled in the vicinity of the simulated airplane and downgradient toward Leon Creek. A maximum of two additional boreholes may be drilled and sampled if field screening results indicate significant contamination extending beyond the proposed sampling area. Proposed borehole locations are shown on Figure 4.1.

One month prior to soil sampling, the expanded-scale bioventing system at Site FC-2 will be shut down to allow soil and soil gas to return to equilibrium conditions. Soil sampling will be conducted by qualified Parsons ES scientists and technicians trained in the conduct of soil sampling, records documentation, and environmental sample chain-



NOTE:
PROPOSED MONITORING WELLS TO BE SAMPLED ARE SHOWN IN BLACK.

LEGEND

- PROPOSED SOIL BOREHOLE LOCATION
- F204 (FT024MW004) — EXISTING MONITORING WELL (IRPIMS WELL NUMBER SHOWN IN PARENTHESES)
- MPA — VAPOR MONITORING POINT
- VW1 — AIR INJECTION VENT WELL
- 1992 ESTIMATED AREA EXCEEDING 1,000 mg/kg TPH IN SOIL

FIGURE 4.1

PROPOSED SOIL AND GROUNDWATER SAMPLING LOCATIONS

Site FC-2
Kelly AFB, Texas

PARSONS ENGINEERING SCIENCE, INC.
Denver, Colorado

S:\ES\cad\AFCEE\726876\KELLY\98DN0013, 03/23/98 at 12:40

of-custody procedures. In order to provide complete documentation of the sampling event, detailed records will be maintained by the Parsons ES field hydrogeologist. In addition, sampling personnel will have thoroughly reviewed this SAP prior to sample collection and will have a copy available onsite for reference.

4.1.1 Drilling, Sampling, and Equipment Decontamination

Boreholes will be advanced using a drill rig equipped with 2.5- to 3.25-inch inside-diameter (ID) hollow-stem augers. Augers and other downhole equipment will be cleaned before use and between boreholes to prevent cross-contamination. Cleaning will be accomplished using a high-pressure, hot-water wash, followed by a potable water rinse at the Kelly AFB facility for large equipment decontamination. Drill cuttings will be managed as described in Section 4.5. Boreholes not backfilled with clean cuttings will be abandoned using cement/bentonite grout following drilling and sampling. The grout mixture will contain a maximum of 5 percent bentonite.

Boreholes will be drilled to approximately 2 feet below the groundwater table surface; total borehole depths are expected to be between 17 and 22 feet bgs. Relatively undisturbed soil samples, suitable for chemical analysis, will be collected from the ground surface to total depth at approximately 5-foot intervals (i.e., sample collection at 0 to 2 feet bgs, 5 to 7 feet bgs, 10 to 12 feet bgs, etc.). Soil types will be classified according to the Unified Soil Classification System (USCS) and described in accordance with the standard Parsons ES soil description format. All soil samples will be visually examined, and sample headspace will be field screened for VOCs using a photoionization detector (PID) or a total volatile hydrocarbon analyzer (TVHA). Based on field screening results, samples with the greatest apparent VOC contamination from each boring will be selected and submitted for laboratory analysis of TPH, VOCs, and SVOCs. For the three soil borings near the simulated aircraft two samples will be submitted for laboratory analysis. One sample (most likely from the smear zone) will be submitted for the soil borings downgradient from the simulated aircraft.

Soil samples will be collected in a standard split-barrel sampler or a Shelby Tube Sampler that will be lowered through the hollow stem of the augers and driven approximately 1.5 feet ahead of the augers into undisturbed soil. Between sampling events, the sampler will be cleaned with Alconox® detergent, followed by successive potable and distilled water rinses.

Collected soil samples will be used for geologic logging and will be screened in the field for organic vapors using a PID or a TVHA. The data obtained from the logging and screening will be recorded on the borehole logs. The samples selected for laboratory analysis will be submitted in an appropriate sample container, labeled with the site name and borehole number, sample depth, date of collection, project name, and other pertinent data. The sample container will be sealed in plastic bags and immediately placed in an insulated cooler containing ice. The soil samples will be maintained in a chilled condition until delivered to the analytical laboratory. Chain-of-custody records will be prepared in the field and will accompany the samples to the analytical laboratory.

4.1.2 Soil Sample Analyses

Proposed soil sample analytical methods, estimated number of samples, and reporting limits are presented in Table 4.1. All samples will be analyzed by a State of Texas-certified and AFCEE-approved laboratory. Parsons ES proposes to analyze samples from Site FC-2 for TPH by USEPA Method SW8015, modified for diesel- and gasoline-range organics; for VOCs by USEPA Method SW8260A; and for SVOCs by USEPA Method SW8270B. Quality control (QC) samples also will be analyzed to assess laboratory methods. The laboratory will perform analyses on one matrix spike/matrix spike duplicate, one laboratory control sample, and one laboratory blank for each specific analytical method requested. Field QC samples will be collected and analyzed as described in Section 4.4.

4.2 GROUNDWATER SAMPLING

This section describes the scope of work required for collecting groundwater samples at existing site groundwater monitoring wells for both field and laboratory analysis. Samples from six existing wells (TC11, F202, F203, F204, F205, and E309) will be collected and sent to the laboratory for VOC analyses. Samples from these six wells also will be analyzed in the field for electron acceptors and other geochemical parameters to assess the degree of natural attenuation of organic contaminants occurring in groundwater at the site. Lastly, samples from two wells, one in the source area (F202) and one upgradient (TC11), will be collected for laboratory methane analysis. The proposed groundwater sampling wells are shown in black on Figure 4.1, and the groundwater analyses to be performed are listed in Table 4.2.

Groundwater sampling will be conducted by qualified Parsons ES scientists and technicians trained in the conduct of well sampling. Groundwater sampling will be performed in accordance with the procedures outlined in this SAP.

4.2.1 Well Purging, Sample Collection, and Decontamination

This section describes the scope of work required for collecting groundwater samples at each of six existing groundwater monitoring wells. All water samples collected from groundwater monitoring wells will be obtained using either disposable bailers, decontaminated Teflon® bailers, or a thoroughly decontaminated peristaltic pump. In order to maintain a high degree of QC during this sampling event, the procedures described in the following sections will be followed.

4.2.1.1 Equipment Decontamination

All portions of sampling and test equipment that will contact the sample will be thoroughly cleaned before each use. This equipment includes the peristaltic pump and tubing, Teflon® bailers, water-level probe and cable, oil/water interface probe and cable, lifting line, test equipment for onsite use, and other equipment or portions thereof which will contact the samples. Based on the types of sample analyses to be conducted, the following decontamination protocol will be used:

TABLE 4.1
PROPOSED SOIL SAMPLE ANALYTICAL METHODS, REPORTING LIMITS, AND NUMBER OF SAMPLES
SITE FC-2
KELLY AFB, TEXAS

Analytical Method	Number of Samples[a/]	Reporting Limit[b/]	Units[c/]	Field or Fixed-Base Laboratory
USEPA Method SW8015 Modified				
Diesel-Range Organics	14	10	mg/kg	Fixed-base
Gasoline-Range Organics	14	1	mg/kg	Fixed-base
USEPA Method SW8260A				
1,1,1,2-Tetrachloroethane	14	3.0	µg/kg	Fixed-base
1,1,1-Trichloroethane	14	4.0	µg/kg	Fixed-base
1,1,2,2-Tetrachloroethane	14	2.0	µg/kg	Fixed-base
1,1,2-Trichloroethane	14	5.0	µg/kg	Fixed-base
1,1-Dichloroethane	14	2.0	µg/kg	Fixed-base
1,1-Dichloroethene	14	6.0	µg/kg	Fixed-base
1,1-Dichloropropene	14	5.0	µg/kg	Fixed-base
1,2,3-Trichlorobenzene	14	2.0	µg/kg	Fixed-base
1,2,3-Trichloropropane	14	20.0	µg/kg	Fixed-base
1,2,4-Trichlorobenzene	14	2.0	µg/kg	Fixed-base
1,2,4-Trimethylbenzene	14	7.0	µg/kg	Fixed-base
1,2-Dibromo-3-chloropropane (DBCP)	14	10.0	µg/kg	Fixed-base
1,2-Dibromoethane (EDB)	14	3.0	µg/kg	Fixed-base
1,2-Dichlorobenzene	14	2.0	µg/kg	Fixed-base
1,2-Dichloroethane	14	3.0	µg/kg	Fixed-base
1,2-Dichloropropane	14	2.0	µg/kg	Fixed-base
1,3,5-Trimethylbenzene	14	3.0	µg/kg	Fixed-base
1,3-Dichlorobenzene	14	6.0	µg/kg	Fixed-base
1,3-Dichloropropane	14	2.0	µg/kg	Fixed-base
1,4-Dichlorobenzene	14	2.0	µg/kg	Fixed-base
1-Chlorohexane	14	3.0	µg/kg	Fixed-base
2,2-Dichloropropane	14	20.0	µg/kg	Fixed-base
2-Chlorotoluene	14	2.0	µg/kg	Fixed-base
4-Chlorotoluene	14	3.0	µg/kg	Fixed-base
Benzene	14	2.0	µg/kg	Fixed-base
Bromobenzene	14	2.0	µg/kg	Fixed-base
Bromochloromethane	14	2.0	µg/kg	Fixed-base
Bromodichloromethane	14	4.0	µg/kg	Fixed-base
Bromoform	14	6.0	µg/kg	Fixed-base
Bromomethane	14	5.0	µg/kg	Fixed-base
Carbon tetrachloride	14	10.0	µg/kg	Fixed-base
Chlorobenzene	14	2.0	µg/kg	Fixed-base
Chloroethane	14	5.0	µg/kg	Fixed-base
Chloroform	14	2.0	µg/kg	Fixed-base
Chloromethane	14	7.0	µg/kg	Fixed-base
cis-1,2-Dichloroethene	14	6.0	µg/kg	Fixed-base
cis-1,3-Dichloropropene	14	NA[d/]	µg/kg	Fixed-base

TABLE 4.1 (Continued)
PROPOSED SOIL SAMPLE ANALYTICAL METHODS, REPORTING LIMITS, AND NUMBER OF SAMPLES
SITE FC-2
KELLY AFB, TEXAS

Analytical Method	Number of Samples[a/]	Reporting Limit[b/]	Units[c/]	Field or Fixed-Base Laboratory
USEPA Method SW8260A (continued)				
Dibromochloromethane	14	3.0	µg/kg	Fixed-base
Dibromomethane	14	10.0	µg/kg	Fixed-base
Dichlorodifluoromethane	14	5.0	µg/kg	Fixed-base
Ethylbenzene	14	3.0	µg/kg	Fixed-base
Hexachlorobutadiene	14	5.0	µg/kg	Fixed-base
Isopropylbenzene	14	8.0	µg/kg	Fixed-base
m-Xylene	14	3.0	µg/kg	Fixed-base
Methylene Chloride	14	2.0	µg/kg	Fixed-base
n-Butylbenzene	14	5.0	µg/kg	Fixed-base
n-Propylbenzene	14	2.0	µg/kg	Fixed-base
Naphthalene	14	2.0	µg/kg	Fixed-base
o-Xylene	14	5.0	µg/kg	Fixed-base
p-Isopropyltoluene	14	6.0	µg/kg	Fixed-base
p-Xylene	14	7.0	µg/kg	Fixed-base
sec-Butylbenzene	14	7.0	µg/kg	Fixed-base
Styrene	14	2.0	µg/kg	Fixed-base
tert-Butylbenzene	14	7.0	µg/kg	Fixed-base
Tetrachloroethene	14	7.0	µg/kg	Fixed-base
Toluene	14	5.0	µg/kg	Fixed-base
trans-1,2-Dichloroethene	14	3.0	µg/kg	Fixed-base
trans-1,3-Dichloropropene	14	NA	µg/kg	Fixed-base
Trichloroethene	14	10.0	µg/kg	Fixed-base
Trichlorofluoromethane	14	4.0	µg/kg	Fixed-base
Vinyl chloride	14	9.0	µg/kg	Fixed-base
USEPA Method SW8270B				
1,2,4-Trichlorobenzene	14	0.7	mg/kg	Fixed-base
1,2-Dichlorobenzene	14	0.7	mg/kg	Fixed-base
1,3-Dichlorobenzene	14	0.7	mg/kg	Fixed-base
1,4-Dichlorobenzene	14	0.7	mg/kg	Fixed-base
2,4,5-Trichlorophenol	14	3.3	mg/kg	Fixed-base
2,4,6-Trichlorophenol	14	0.3	mg/kg	Fixed-base
2,4-Dichlorophenol	14	0.3	mg/kg	Fixed-base
2,4-Dimethylphenol	14	0.3	mg/kg	Fixed-base
2,4-Dinitrophenol	14	3.3	mg/kg	Fixed-base
2,4-Dinitrotoluene	14	0.7	mg/kg	Fixed-base
2,6-Dinitrotoluene	14	0.7	mg/kg	Fixed-base
2-Chloronaphthalene	14	0.7	mg/kg	Fixed-base
2-Chlorophenol	14	0.7	mg/kg	Fixed-base

TABLE 4.1 (Continued)
PROPOSED SOIL SAMPLE ANALYTICAL METHODS, REPORTING LIMITS, AND NUMBER OF SAMPLES
SITE FC-2
KELLY AFB, TEXAS

Analytical Method	Number of Samples[a/]	Reporting Limit[b/]	Units[c/]	Field or Fixed-Base Laboratory
USEPA Method SW8270B (continued)				
2-Methylnaphthalene	14	0.7	mg/kg	Fixed-base
2-Methylphenol	14	0.3	mg/kg	Fixed-base
2-Nitroaniline	14	3.3	mg/kg	Fixed-base
2-Nitrophenol	14	0.3	mg/kg	Fixed-base
3,3'-Dichlorobenzidine	14	1.3	mg/kg	Fixed-base
3-Nitroaniline	14	3.3	mg/kg	Fixed-base
4,6-Dinitro-2-methylphenol	14	3.3	mg/kg	Fixed-base
4-Bromophenylphenylether	14	0.7	mg/kg	Fixed-base
4-Chloro-3-methylphenol	14	1.3	mg/kg	Fixed-base
4-Chloroanaline	14	1.3	mg/kg	Fixed-base
4-Chlorophenyl-phenylether	14	0.7	mg/kg	Fixed-base
4-Methylphenol	14	0.3	mg/kg	Fixed-base
4-Nitroaniline	14	3.3	mg/kg	Fixed-base
4-Nitrophenol	14	1.6	mg/kg	Fixed-base
Acenaphthene	14	0.7	mg/kg	Fixed-base
Acenaphthylene	14	0.7	mg/kg	Fixed-base
Anthracene	14	0.7	mg/kg	Fixed-base
Benzo(a)anthracene	14	0.7	mg/kg	Fixed-base
Benzo(a)pyrene	14	0.7	mg/kg	Fixed-base
Benzo(b)fluoranthene	14	0.7	mg/kg	Fixed-base
Benzo(g,h,i)perylene	14	0.7	mg/kg	Fixed-base
Benzoic Acid	14	1.6	mg/kg	Fixed-base
Benzyl alcohol	14	1.3	mg/kg	Fixed-base
bis(2-Chloroethoxy)methane	14	0.7	mg/kg	Fixed-base
bis(2-Chloroethyl)ether	14	0.7	mg/kg	Fixed-base
bis(2-Chloroisopropyl)ether	14	0.7	mg/kg	Fixed-base
bis(2-Ethylhexyl) phthalate	14	0.7	mg/kg	Fixed-base
Butylbenzyl phthalate	14	0.7	mg/kg	Fixed-base
Chrysene	14	0.7	mg/kg	Fixed-base
Di-n-butylphthalate	14	0.7	mg/kg	Fixed-base
Di-n-octylphthalate	14	0.7	mg/kg	Fixed-base
Dibenzo(a,h)anthracene	14	0.7	mg/kg	Fixed-base
Dibenzofuran	14	0.7	mg/kg	Fixed-base
Diethyl phthalate	14	0.7	mg/kg	Fixed-base

TABLE 4.1 (Continued)
PROPOSED SOIL SAMPLE ANALYTICAL METHODS, REPORTING LIMITS, AND NUMBER OF SAMPLES
SITE FC-2
KELLY AFB, TEXAS

Analytical Method	Number of Samples[a/]	Reporting Limit[b/]	Units[c/]	Field or Fixed-Base Laboratory
USEPA Method SW8270B (continued)				
Dimethyl phthalate	14	0.7	mg/kg	Fixed-base
Fluoranthene	14	0.7	mg/kg	Fixed-base
Fluorene	14	0.7	mg/kg	Fixed-base
Hexachlorobenzene	14	0.7	mg/kg	Fixed-base
Hexachlorobutadiene	14	0.7	mg/kg	Fixed-base
Hexachlorocyclopentadiene	14	0.7	mg/kg	Fixed-base
Hexachloroethane	14	0.7	mg/kg	Fixed-base
Indeno(1,2,3-cd)pyrene	14	0.7	mg/kg	Fixed-base
Isophorone	14	0.7	mg/kg	Fixed-base
n-Nitrosodiphenylamine	14	0.7	mg/kg	Fixed-base
n-Nitrosodipropylamine	14	0.7	mg/kg	Fixed-base
Naphthalene	14	0.7	mg/kg	Fixed-base
Nitrobenzene	14	0.7	mg/kg	Fixed-base
Pentachlorophenol	14	3.3	mg/kg	Fixed-base
Phenanthrene	14	0.7	mg/kg	Fixed-base
Phenol	14	0.3	mg/kg	Fixed-base
Pyrene	14	0.7	mg/kg	Fixed-base

[a/] Excludes QC samples. If optional boreholes are required, one or two additional soil samples per optional borehole also will be collected and analyzed by USEPA Methods SW8015(modified), SW8260A, and SW8270B.

[b/] Project reporting limit as specified in subcontract for analytical services.

[c/] mg/kg = milligrams per kilogram; µg/kg = micrograms per kilogram.

[d/] NA = not available.

TABLE 4.2
PROPOSED GROUNDWATER SAMPLE ANALYTICAL METHODS, REPORTING LIMITS, AND NUMBER OF SAMPLES
SITE FC-2
KELLY AFB, TEXAS

Analytical Method	Number of Samples[a]	Reporting Limit[b]	Units[c]	Field or Fixed-Base Laboratory
USEPA Method SW8260A				
1,1,1,2-Tetrachloroethane	6	0.5	µg/L	Fixed-base
1,1,1-Trichloroethane	6	0.8	µg/L	Fixed-base
1,1,2,2-Tetrachloroethane	6	0.4	µg/L	Fixed-base
1,1,2-Trichloroethane	6	1.0	µg/L	Fixed-base
1,1-Dichloroethane	6	0.4	µg/L	Fixed-base
1,1-Dichloroethene	6	1.2	µg/L	Fixed-base
1,1-Dichloropropene	6	1.0	µg/L	Fixed-base
1,2,3-Trichlorobenzene	6	0.3	µg/L	Fixed-base
1,2,3-Trichloropropane	6	3.2	µg/L	Fixed-base
1,2,4-Trichlorobenzene	6	0.4	µg/L	Fixed-base
1,2,4-Trimethylbenzene	6	1.3	µg/L	Fixed-base
1,2-Dibromo-3-chloropropane (DBCP)	6	2.6	µg/L	Fixed-base
1,2-Dibromoethane (EDB)	6	0.6	µg/L	Fixed-base
1,2-Dichlorobenzene	6	0.3	µg/L	Fixed-base
1,2-Dichloroethane	6	0.6	µg/L	Fixed-base
1,2-Dichloropropane	6	0.4	µg/L	Fixed-base
1,3,5-Trimethylbenzene	6	0.5	µg/L	Fixed-base
1,3-Dichlorobenzene	6	1.2	µg/L	Fixed-base
1,3-Dichloropropane	6	0.4	µg/L	Fixed-base
1,4-Dichlorobenzene	6	0.3	µg/L	Fixed-base
1-Chlorohexane	6	0.5	µg/L	Fixed-base
2,2-Dichloropropane	6	3.5	µg/L	Fixed-base
2-Chlorotoluene	6	0.4	µg/L	Fixed-base
4-Chlorotoluene	6	0.6	µg/L	Fixed-base
Benzene	6	0.4	µg/L	Fixed-base
Bromobenzene	6	0.3	µg/L	Fixed-base
Bromochloromethane	6	0.4	µg/L	Fixed-base
Bromodichloromethane	6	0.8	µg/L	Fixed-base
Bromoform	6	1.2	µg/L	Fixed-base
Bromomethane	6	1.1	µg/L	Fixed-base

TABLE 4.2 (Continued)
PROPOSED GROUNDWATER SAMPLE ANALYTICAL METHODS, REPORTING LIMITS, AND NUMBER OF SAMPLES
SITE FC-2
KELLY AFB, TEXAS

Analytical Method	Number of Samples[a/]	Reporting Limit[b/]	Units[c/]	Field or Fixed-Base Laboratory
USEPA Method SW8260A (Continued)				
Carbon tetrachloride	6	2.1	µg/L	Fixed-base
Chlorobenzene	6	0.4	µg/L	Fixed-base
Chloroethane	6	1.0	µg/L	Fixed-base
Chloroform	6	0.3	µg/L	Fixed-base
Chloromethane	6	1.3	µg/L	Fixed-base
cis-1,2-Dichloroethene	6	1.2	µg/L	Fixed-base
cis-1,3-Dichloropropene	6	NA[d/]	NA	Fixed-base
Dibromochloromethane	6	0.5	µg/L	Fixed-base
Dibromomethane	6	2.4	µg/L	Fixed-base
Dichlorodifluoromethane	6	1.0	µg/L	Fixed-base
Ethylbenzene	6	0.6	µg/L	Fixed-base
Hexachlorobutadiene	6	1.1	µg/L	Fixed-base
Isopropylbenzene	6	0.5	µg/L	Fixed-base
m-Xylene	6	0.5	µg/L	Fixed-base
Methylene Chloride	6	0.3	µg/L	Fixed-base
n-Butylbenzene	6	1.1	µg/L	Fixed-base
n-Propylbenzene	6	0.4	µg/L	Fixed-base
Naphthalene	6	0.4	µg/L	Fixed-base
o-Xylene	6	1.1	µg/L	Fixed-base
p-Isopropyltoluene	6	1.2	µg/L	Fixed-base
p-Xylene	6	1.3	µg/L	Fixed-base
sec-Butylbenzene	6	1.3	µg/L	Fixed-base
Styrene	6	0.4	µg/L	Fixed-base
tert-Butylbenzene	6	1.4	µg/L	Fixed-base
Tetrachloroethene	6	1.4	µg/L	Fixed-base
Toluene	6	1.1	µg/L	Fixed-base
trans-1,2-Dichloroethene	6	0.6	µg/L	Fixed-base
trans-1,3-Dichloropropene	6	NA	NA	Fixed-base
Trichloroethene	6	1.0	µg/L	Fixed-base
Trichlorofluoromethane	6	0.8	µg/L	Fixed-base

TABLE 4.2 (Continued)
PROPOSED GROUNDWATER SAMPLE ANALYTICAL METHODS, REPORTING LIMITS, AND NUMBER OF SAMPLES
SITE FC-2
KELLY AFB, TEXAS

Analytical Method	Number of Samples[a/]	Reporting Limit[b/]	Units[c/]	Field or Fixed-Base Laboratory
USEPA Method SW8260A (Continued)				
Vinyl chloride	6	1.1	µg/L	Fixed-base
USEPA SW9056				
Sulfate	6	0.2	mg/L	Fixed-base
RSKSOP 175[e/]				
Methane	2	NA	NA	Fixed-base
Hach Method 8000 Series[f/]				
Nitrate	6	---	---	Field
Nitrite	6	---	---	Field
Sulfide	6	---	---	Field
Ferrous Iron	6	---	---	Field
Manganese	6	---	---	Field
Direct-Reading Meter				
pH	6	---	---	Field
Conductivity	6	---	---	Field
Temperature	6	---	---	Field
Dissolved Oxygen	6	---	---	Field
Redox Potential	6	---	---	Field

[a/] Excludes QC samples.

[b/] Project reporting limit as specified in subcontract for analytical services.

[c/] µg/L = micrograms per liter; mg/L = milligrams per liter.

[d/] NA = not available.

[e/] National Risk Management Research Laboratory (formerly Robert S. Kerr Research Laboratory) Standard Operating Procedure for methane or equivalent.

[f/] "Hach" refers to methods described in the Hach Company catalog, 1990.

- Clean with potable water and phosphate-free laboratory detergent;
- Rinse with potable water;
- Triple rinse with distilled or deionized water;
- Air dry the equipment prior to use.

If precleaned, dedicated sampling equipment is used, the decontamination protocol specified above will not be required. Teflon® bailers and/or tubing will be dedicated for use at only one sampling location and will be properly disposed of following sampling. Laboratory-supplied sample containers will be cleaned and sealed by the laboratory. Sampling and test equipment decontamination and rinseate water will be collected in 5-gallon buckets or US Department of Transportation (DOT)-approved 55-gallon drums and transported to the OPTEC Environmental Process Control Facility (the former Kelly AFB IWTP) for disposal.

4.2.1.2 Well Purging

Prior to removing any water from the well to be sampled, the static water level will be measured. An electrical water level probe will be used to measure the depth to groundwater below the datum to the nearest 0.01 foot. After measuring the static water level, the water level probe will be lowered slowly to the bottom of the well, and the total well depth will be measured to the nearest 0.01 foot. Based on these measurements, the volume of water to be purged from the well can be calculated. The volume of water contained within the well casing at the time of sampling will be calculated, and either three times the calculated volume will be removed from the well or until field measurements of pH, temperature, and specific conductivity of the purge water become stable (which ever volume is greater). The pH, temperature, and specific conductivity will be monitored before, during, and after well purging and recorded on well sampling forms. Purge water will be collected in 5-gallon buckets or DOT-approved 55-gallon drums and transported to the OPTEC Environmental Process Control Facility for disposal.

4.2.1.3 Sample Extraction

Disposable, polyethylene or Teflon® bailers, or a thoroughly decontaminated peristaltic pump will be used to extract groundwater samples from the wells. The extraction equipment will be lowered into the water gently to prevent splashing and extracted gently to prevent creation of excessive vacuum in the well. The sample will be transferred directly to the appropriate sample container. The water sample will be transferred from the bottom of the bailer using a bottom-emptying device to allow a controlled flow into the sample container. Water from the peristaltic pump can be directly discharged into the sample container. The water will be carefully poured down the inner walls of the sample bottle to minimize aeration of the sample. Unless other instructions are given by the analytical laboratory, sample containers will be completely filled so that no air space remains in the container.

4.2.2 Onsite Chemical Parameter Measurement

Many of the groundwater chemical parameters will be measured onsite by Parsons ES personnel (Table 4.2). Some of the measurements will be made using direct-reading meters, while others will be made using a Hach® portable colorimeter in accordance with specific Hach® analytical procedures. These procedures are described in the following subsections.

All glassware or plasticware used in the analyses will have been cleaned prior to sample collection by thoroughly washing with a solution of Alconox® and water, and rinsing with deionized water and ethanol to prevent interference or cross contamination between measurements. If concentrations of an analyte are above the range detectable by the titrimetric method, the analysis will be repeated by diluting the groundwater sample with double-distilled water until the analyte concentration falls to a level within the range of the method. Sample reagents to be used for field analysis are composed of innocuous salts, and only a few grams of the reagents will be required. All rinseate and sample reagents accumulated during field groundwater analysis will be accumulated with purge waters in 5-gallon buckets or DOT-approved 55-gallon drums and transported to the OPTEC Environmental Process Control Facility for disposal.

4.2.2.1 Dissolved Oxygen Measurements

Dissolved oxygen (DO) is an important electron acceptor in the aerobic biodegradation of dissolved fuel hydrocarbons. DO measurements will be made using a meter with a downhole oxygen sensor or a sensor in a flow-through cell. Measurements will be taken before and following groundwater sample acquisition. When DO measurements are taken in monitoring wells that have not yet been sampled, the existing monitoring wells will be purged until DO levels stabilize. Measured values will be recorded in the groundwater sampling record.

4.2.2.2 pH, Temperature, and Specific Conductance

Because the pH, temperature, and specific conductance of a groundwater sample can change significantly within a short time following sample acquisition, these parameters will be measured in the field in unfiltered, unpreserved, "fresh" water collected by the same technique as the samples taken for laboratory analyses. The measurements will be made in a clean glass container separate from those intended for laboratory analysis, and the measured values will be recorded in the groundwater sampling record.

4.2.2.3 Other Electron Acceptor Measurements

Nitrate, nitrite, sulfate, and ferrous iron concentrations in groundwater act as potential electron acceptors for fuel hydrocarbon degradation under anaerobic conditions. These analytes will be measured by experienced Parsons ES scientists via colorimetric analysis using a Hach® portable colorimeter according to the appropriate Hach® methods (Table 4.2).

4.2.2.4 Reduction/Oxidation Potential

The reduction/oxidation (redox) potential of groundwater is an indicator of the relative tendency of a solution to accept or transfer electrons. Redox reactions in groundwater often are biologically mediated; therefore, the redox potential of a groundwater system depends upon and influences rates of biodegradation. Redox potentials can be used to provide real-time data on the location of the contaminant plume, especially in areas undergoing anaerobic biodegradation. The redox potential of a groundwater sample can change significantly within a short time following sample acquisition and exposure to atmospheric oxygen. Therefore, this parameter will be measured in the field in unfiltered, unpreserved, "fresh" water collected by the same technique as the samples taken for laboratory analyses. The measurements will be made as quickly as possible in a clean glass container separate from those intended for laboratory analysis.

4.2.3 Sample Handling

Sample containers and appropriate container lids will be provided by the laboratory. The laboratory will add any necessary chemical preservatives prior to shipping the containers to the site. The sample containers will be filled as described in Section 4.2.1.3, and the container lids will be tightly closed. The sample bottles will be labeled with the site name and well number, sample depth, date of collection, project name, and other pertinent data. Samples will be properly prepared for transportation to the laboratory by placing the samples in a cooler containing ice to maintain a shipping temperature of approximately 4 degrees centigrade (°C). Chain-of-custody records will be prepared in the field and will accompany the samples to the analytical laboratory.

4.2.4 Groundwater Analyses

Proposed groundwater sample analytical methods and laboratory reporting limits are presented in Table 4.2. All samples will be analyzed by a State of Texas-certified and AFCEE-approved laboratory. Parsons ES proposes to analyze groundwater samples from Site FC-2 for BTEX and other VOCs by USEPA Method SW8260A; for sulfate by USEPA Method SW9056; and for methane by Robert S. Kerr Standard Operating Procedure (RSKSOP) 175 or equivalent. QC samples also will be analyzed to assess laboratory methods. The laboratory will perform analyses on one matrix spike/matrix spike duplicate, one laboratory control sample, and one laboratory blank for each specific analysis requested. Field QC samples will be collected and analyzed as described in Section 4.4.

4.3 CHAIN-OF-CUSTODY CONTROL

After the samples for laboratory analysis have been collected, chain-of-custody procedures will be followed to establish a written record of sample handling and movement between the sampling site and the laboratory. Samples collected for onsite field analyses will not require chain-of-custody records. Each shipping container will have a chain-of-custody form completed in triplicate by the sampling personnel. One copy of this form will be kept by the sampling contractor after sample delivery to the analytical laboratory, and the other two copies will be retained at the laboratory. One

of the laboratory copies will become a part of the permanent record for the sample and will be returned with the sample analytical results. The chain-of-custody will contain the following information:

- Site name and address;
- Sample identification number;
- Sample collector's printed name and signature;
- Date and time of collection;
- Place and address of collection;
- Type of sample (i.e. composite, grab, etc.);
- Sample matrix (soil or groundwater);
- Chemical preservatives added;
- Analytical laboratory to be utilized;
- Analyses requested;
- Signatures of individuals involved in the chain of possession; and
- Inclusive dates of possession.

The chain-of-custody documentation will be placed inside the shipping container so that it will be immediately apparent to the laboratory personnel receiving the container, but will not be damaged or lost during transport. The shipping container will be sealed so that it will be obvious if the seal has been tampered with or broken.

4.4 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Samples must be collected, preserved, transported, and analyzed in such a manner that sampling results yield information which provides a reliable representation of the soil and groundwater quality at the site. To meet this requirement, the procedures described in Sections 4.1 and 4.2 will be followed during sample collection, handling, and analysis. In addition, laboratory QC samples will be analyzed as described in Sections 4.1.2 and 4.2.4.

Field QA/QC for groundwater and soil will include collection of field replicates, rinseate blanks, and trip blanks. Groundwater QA/QC sampling will include one duplicate sample (minimum frequency of 10 percent), one rinseate blank, and one trip blank for each cooler with samples designated for VOC analysis. Soil QC sampling will include two duplicates (minimum frequency of 10 percent), one rinseate blank, and one trip blank for each cooler with samples designated for VOC analysis.

4.5 MANAGEMENT OF INVESTIGATION-DERIVED WASTES

Clean soil cuttings generated during drilling will be returned to their respective borehole and contaminated drill cuttings will be containerized in DOT-approved 55-gallon drums. The drums will be labeled with the site name, drilling date, borehole number, and depth intervals. The soil will be transported to the Kelly AFB soil staging area and will be disposed of by Kelly AFB. Purge waters and small equipment decontamination and rinseate water will be accumulated in 5-gallon buckets or DOT-approved 55-gallon drums and transported to the OPTEC Environmental Process Control Facility (former Base IWTP) for discharge and treatment. Decontamination of the hollow-stem augers and drill rig will be performed at the Kelly AFB facility for large equipment decontamination which is now run by Science Application International Corporation, Building 618.

SECTION 5

SITE CONFIRMATION SAMPLING REPORT FORMAT

Following receipt of the laboratory analytical results, a draft confirmation soil and groundwater sampling report will be prepared and submitted to TNRCC, Kelly AFB, and AFCEE.

The report will contain the following information for Site FC-2:

- This confirmation SAP (as an appendix);
- Site plot plan showing sampling locations;
- Summary of field activities;
- Assessment of soil analytical results in comparison to applicable TNRCC soil cleanup criteria for VOCs and SVOCs (see Table 3.1);
- Assessment of the potential for remediation by natural attenuation in groundwater;
- Laboratory analytical reports and chain-of-custody forms;
- Borehole logs; and
- Conclusions and recommendations for NFRAP and site closure, or additional cleanup action(s).

SECTION 6

KELLY AFB SUPPORT REQUIREMENTS

The following Kelly AFB support is needed prior to the arrival of the drillers and the Parsons ES team:

- Assistance in obtaining drilling and digging permits.
- Arrange soil borehole survey location, if desired by Kelly AFB.
- Arrangement of site access for Parsons ES and the drilling subcontractor.
- Provision of an acceptable area for large equipment decontamination.
- Provision of a potable water supply for drilling and decontamination activities.
- Assistance in handling/disposal of soil cuttings and purge/rinseate waters in accordance with Section 4.5.

SECTION 7

PROJECT SCHEDULE

The following schedule is contingent upon approval of this confirmation SAP and fulfillment of the Kelly AFB support requirements outlined in Section 6.

Event	Date
Submit Draft Confirmation SAP to AFCEE, and Kelly AFB	27 February 1998
Receipt of AFCEE and Kelly AFB Comments	13 March 1998
Submit Draft Final SAP to AFCEE, Kelly AFB, and TNRCC*	31 March 1998
Receipt of AFCEE, Kelly AFB, and TNRCC Comments, if any	1 May 1998
Submit Final SAP to AFCEE, Kelly AFB, and TNRCC, if necessary*	15 May 1998
Begin Confirmation Sampling	1 June 1998
Submit Draft Confirmation Sampling Report to AFCEE and Kelly AFB	August 1998
Receipt of AFCEE and Kelly AFB Comments	September 1998
Submit Draft Final Confirmation Sampling Report to AFCEE, Kelly AFB, and TNRCC	October 1998

* Copies of SAP for TNRCC sent to Kelly AFB for submittal.

SECTION 8

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SECTION 9

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APPENDIX B
BORING LOGS AND GROUNDWATER SAMPLING FORMS

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB	WELL OR BORING NO.: FC2 - B1
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: Mob. Le B61
DRILLING METHOD: 4¼" ID HSA	DRILLER: Eric Jones
SAMPLING METHOD: 2' S/S & 1.5' S/S	LOGGED BY: S. Pearson
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL): 14'
DRILLING START: 6-10-98 - 0800	TOTAL DEPTH (ft-BGL): 15'
DRILLING END: 6-10-98 - 0840	FINAL COMPLETION DATE:

SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
	1.7	4.7 7.2 9.3	0-2 FILL, CLAY & GRAVEL, some silt & sand, dry, v. dense, v. plastic. 10YR 5/1, gray. Pebble sized gravel. rounded.	8.7		2' S/S hammer
	Ø		overdrill ~~0-3'~~ 0.5			
	1.3	10.0 6.7 7.0	3'-5' FILL, CLAY, some pebble-sized gravel, mod. sl. damp. little silt, 10YR 5/1, gray, plastic. m. dense.	2.3		
			7-10 overdrill			
	1.9	0.0 0.0 0.0 0.0	10-10.8 as above, damp. 10.8-12 Clay, silty, plastic, moist, 10YR 2/2 v. d. brown.	0.6		
	1.6	0.0 0.0 0.0	12-~~13~~13.5 as above. moist-wet. soft, sl. plastic.	0.3		FC2-SB1-13.5' 0840 VOC SVOC TPH
	1.1	0.0 0.0 0.0	~~13.5~~ 14 - ~~15~~ 14.5 Gravel, coarse-grained, angular, loose, non-plas, saturated, poorly sorted 14.5-15' SAND, glauconitic, saturated, loose, non. v. poorly sorted, angular. little 5Y 4/4, olive			

TD - 15.0'

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB - AFCEE	WELL OR BORING NO.: FC2-SB2
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: Mob. Le Bel
DRILLING METHOD: 4¼" HSA	DRILLER: Eric Jones
SAMPLING METHOD: 2' S/S 1.5' S/S	LOGGED BY: S. Pearson
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL): 14
DRILLING START: 0900	TOTAL DEPTH (ft-BGL): 17.5
DRILLING END:	FINAL COMPLETION DATE:

SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
		3.6 2.8 1.0	overdrill, 0-3 FILL			
			3'-4' FILL, CLAY & GRAVEL, some coarse sand & silt, poorly sorted, pebbles & cobbles. dry, stiff, v. plastic. 10YR 3/2.		FC2-SB2-3' metals only	
			4'-5' FILL CLAY, some marl & caliche, trace of gravel (pebble) dry, damp, stiff, plastic. little sand & silt.			
			overdrill 5'-10'			
	1.3	2.8 1.7 1.7	10'-12' FILL, Red brick, wood, clay, gravel. damp, looze, non plastic. <moist		~~Sample~~ ~~FC2-SB2-11'~~	
	0.5		FILL, SAB, V. poor recovery.			
	2.0	46.1 867 632 54 227	14-14.5 Clay, Silt, wet, saturated caliche & marl, laminated. 14.5-15.5 Clay, V-soft, Saturated. Strong HC odor Marly. 15.5-16 Clay SAB 14-14.5'		0945 FC2-SB2-15' VOC, SVOC, TPH	
		58 102	16-17.1 SAB gravel in shoe			

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB - AFCEE	WELL OR BORING NO.: FC2-SB3
PROJECT: FC-2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: Mobile B61
DRILLING METHOD: 4¼" ID HSA	DRILLER: Eric Jones
SAMPLING METHOD: 2'	LOGGED BY: S. Pearson
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL): 17'
DRILLING START: 1040	TOTAL DEPTH (ft-BGL):
DRILLING END:	FINAL COMPLETION DATE:

SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
0			0-3.5 Concrete asphalt - overdrill			
3.5			Road base - gravel. - overdrill			
5	1.3	0 0 0	5-7 FILL, CLAY, MARL, ~~GRAY~~ GRAVEL, stiff, plastic, damp, 10YR 3/2			
7			7-10 overdrill			
10	1.7	20.3 17.4 27.7 41.1	10-12 FILL, GRAVEL & CONCRETE, v. poorly sorted, angular, pebble to cobble-sized, clay matrix, grey.			
		58.6 29.2 30.1 11.2	12-14 CLAY, SANDY CLAY w/ gravel, HC odor, concrete fill.		~~FC2-SB3~~ ~~-12~~	
14	0.4	1.2 6.3	14-16 Poor recovery CLAY, soft - v. stiff ~~brn~~ plastic, moist. 10YR 2/2 Marl layer. small concrete fragment. red brick fragments. Sewage odor			
16	1.6	196 283 348 284	16-17 FILL, gravelly, saturated, 10YR 2/2. 17-18 CLAY, wet, HC odor, JP-4. black, 10YR 2/2 ~~brn~~ soft, plastic silty.		FC2-SB3 -17	
18						
20						

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB AFLEE	WELL OR BORING NO.: FC2-SB4
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: Mobile B61
DRILLING METHOD: 4¼ ID HSA	DRILLER: Eric Jones
SAMPLING METHOD: S/S	LOGGED BY: S. Rees
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL): 17'
DRILLING START:	TOTAL DEPTH (ft-BGL):
DRILLING END:	FINAL COMPLETION DATE:

SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
0	1.6	0 0 0 0	0-2 SILT & Limestone gravel. FILL Dense, non plas., dry. 10YR 8/3			
2			Overdrill			
5	1.7	5 16.3 81.8	5-7' FILL, CLAY, damp, plastic, m. stiff. some silt & pebbles. red brick fragments. Some marl at 6.5'.			
7			Overdrill			
10	0.9	0 0 0 0	10-12 CLAY, m. stiff, damp-moist, plastic, trace of gravel. little silt & sand. ~~FILL~~			
12			Overdrill			
15		0 0	~~FILL~~ Reburd gravel & wood			
15.1			Overdrill to 17 thru gravel		FC2-SB4-17.5 VOC, SVOC, TPH	
17		221 1264	17-19 Gravel, poorly sorted, angular, Saturated, Strong HC odor.			
			TD - 19.0'			

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB - AFCEE	WELL OR BORING NO.: FC2-SB5
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEOL	DRILLING RIG: Mobile B61
DRILLING METHOD: 4¼" ID HSA	DRILLER: Eric Jones
SAMPLING METHOD: S/S	LOGGED BY: S. Rawson
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL):
DRILLING START: 2:15 6-10-98	TOTAL DEPTH (ft-BGL):
DRILLING END:	FINAL COMPLETION DATE:

SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
0	0.8	0 0	0-1 Silt, dark/v. stiff, little gravel, compacted, dry, refusal at 1'. 10YR 6/2.			
1			1-5 Overdrill			
5	1.1	0 0 0	5-7' CLAY, soft, plas, damp, mottled, trace of gravel (pebbles) & silt, 10YR 3/1.			
7			7-10 Overdrill			
0	1.6	0 0 0 0	10-12 CLAY, some gravel, pebble & cobbles, stiff, & plas, damp 10YR 3/1			
12			12-15 Overdrill			
	1.0	0 0 0	~~12-14~~ Clay, Sab. moist, little gravel. no HC. m-stiff, plas.			
14	2.0	0 0 10.8 11.0	14-16 Clay, Sab. m-stiff-soft. plas - sl. plas. Sl. HC odr.			
16	1.7	58 14	16-17.7 Clay, Sab. moist ~~wet~~ 17.7-18 Gravel, fine, angular. loose, saturated			
18						

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB AFCEE	WELL OR BORING NO.: FC2-SB6
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: Mob. Le B61
DRILLING METHOD: 4¼" ID HSA	DRILLER: Eric Jones
SAMPLING METHOD: S/S	LOGGED BY: S. Pearson
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL): 19
DRILLING START: 6-12 @ 0700	TOTAL DEPTH (ft-BGL): 20
DRILLING END:	FINAL COMPLETION DATE: 6-12

DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
0				overdrill gravel Fill			
3							
		1.4	B 7 9.2	3-5 clay, dark brown, damp, sl HC odor, m. stiff, plastic		FC2-SB6-3 & ~~Dup Cp metals~~ VOC, SVOC, TPH	
5							
12		1.5	0 0 0	12-14 CLAY, m. stiff, plas, moist, trace of gravel, dark brown, 10YR 3/2			
14		1.5	0 0 0	14-16 As above, moist, plas, m. stiff 10YR 3/2			
16		1.9	— — —	16-18 as above			
18		1.2		18-20 18-18.4 Large Chert (f. at sizes) 18.4-19.8 Fragmented chert gravel. Silt. dense, mo 19.8-20 ~~Clay, dark, stiff, v. plas 10YR 3/2~~		Sample FC2-SB6-19 VOC, SVOC, TPH	
				TD = 20			

PAGE OF

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB OFCEE	WELL OR BORING NO.: FC2-SB7-#
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: B61
DRILLING METHOD: 4¼" ID HSA	DRILLER: Eric Jones
SAMPLING METHOD: S/S	LOGGED BY: S. Pearson
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL): 19.8
DRILLING START: 0815 6-12-98	TOTAL DEPTH (ft-BGL):
DRILLING END:	FINAL COMPLETION DATE:

SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
0	1.5	0 0 0	0-1.5 Clay, silty, dry, dusp, v. stiff, v. plus, gravelly. 7.5YR 3/2.		FC2-SB7-1 0815 metals Dup C MS/MSD	
2			1.5-2 Gravel, cobbles, angular, sand, silt matrix			
			2-15 OVERDRILL Strong smell			Equip. Blank 2 @ 0820 for VOC & SVOC, TPH
15			15-17 PUSH W/ Rammer			
17	2.0	0.4 0 0	17-19 Clay, moist, 10YR 3/2, plastic, m. stiff. trace silt, sand, cobble modules.		Sample FC2-SB7-19 VOC, SVOC TPH Dup D MS/MSD	
19	1.6	08	19-19.8 SAB.			
			19.8-21 - Gravelly clayey, fragmented Saturated, loose.			

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Tyndall AFB - AFCEE	WELL OR BORING NO.: FC2-SB8
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: B61
DRILLING METHOD: 4¼" HSA	DRILLER: Eric Jones
SAMPLING METHOD: S/S	LOGGED BY: S. Pearson
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL): 17.8
DRILLING START: 6-12-98 0855	TOTAL DEPTH (ft-BGL): 19
DRILLING END:	FINAL COMPLETION DATE:

DEPTH (FEET)	SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
0			0 0 0	0-2 clay & gravel, pebbled, sized, stiff, v. plas-, damp, 10YR 4/6, FILL.			
2				Overdrill			
4		1.6	0.2 0.3 1.9	4-6 ~~is above~~. 10YR 3/4 CLAY, some gravel & cobbles. dry-damp, stiff, plastic		Sample FC2-SB8-6 VOC, SVOC, TPH 0925	
				6'-15' overdrill			
15		2.0	28 36 41	15'-17' CLAY, moist, plastic, v. stiff, 10YR 3/1. occasional cobble slight HC odor			
17		1.8	28 39 42	17-17.7 Sub, moist-wet, plastic, v. stiff, 10YR 3/1 occasional pebble.		Sample FC2-SB8-17 VOC, SVOC, metals 0945	TPH
			8	17.7-18.8 Gravel, angular, chert, pebble, poorly sorted saturated.			
				18.8-19' CLAY, stiff, v. plas, damp. 10YR 5/6. mottled gray,			

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB - AFIGW	WELL OR BORING NO.: FC2-SB9
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: B61
DRILLING METHOD: 4¼" ID HSA	DRILLER: Eric Jones
SAMPLING METHOD: S/S	LOGGED BY: S. Pierson
BOREHOLE DIA.: 9"	WATER FOUND (ft-BGL): 15.7
DRILLING START: 6-12-98 1005	TOTAL DEPTH (ft-BGL): 16
DRILLING END:	FINAL COMPLETION DATE:

SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
			0-14 Over drill			
			14-14.3 CLAY, moist, soft, plastic, 10YR3/1.			
			14.3-15.7 SANDY CLAY, moist, mstiff - v dense, plastic, moist. Sl. HC odor. F.g. & m.g. SAND			
			15.7-16 Coarse SAND & fine gravel, Saturated, loose, mon. Poorly Sorted, angular, Some pebbles, 1.HC clay, poorly graded. 10YR5/2		FC2-SB9-15 VOC, SVOC, TPH 1030	
			TD = 16			

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB - AFCEE	WELL OR BORING NO.: FC2-SB10
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: B61
DRILLING METHOD: 4 1/4" HSA	DRILLER: Eric Jones
SAMPLING METHOD: S/S	LOGGED BY: S. Pearson
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL): 15.8
DRILLING START: 6-12-98 1045	TOTAL DEPTH (ft-BGL): 16
DRILLING END:	FINAL COMPLETION DATE:

DEPTH (ft)	SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
0		1.3	0 0 0	0-2 CLAY w/ GRAVEL, dry, dense, non plas. 10YR 6/4. pebble-sized gravel. LITHO SILT & SAND.		FC2-SB10-1. metals.	
2			–	OVER DRILL FILL			
3			–	5-7 Push - No recovery, plugged off. Concrete in shd. Sample (S/S) gouged by rebar?			
7				Overall. JEDI reports fill to 8'			
10		2.0	14 16 17	10-12 Clay, some angular gravel (quartz - pebble-sized) m. stiff, plastic, damp - moist.			
12			12 48 52	12-14 SAB			
14			136 129 +1000	14-15.4 SAB 15.8-16 Coarse SAND & FINE gravel. Saturated, loose, non, HC Stained. Strong odor.		FC2-SB10-15.5 Dup E VOX, SVOX, TPH	

DRILLING LOG	ENGINEERING-SCIENCE, INC.	REF LOGBOOK:

CLIENT: Kelly AFB - DFCEE	WELL OR BORING NO.: FC2-SB11
PROJECT: FC2	SITE LOCATION: FC2
DRILLING CONTRACTOR: JEDI	DRILLING RIG: B61
DRILLING METHOD: 4¼" ID HSA	DRILLER: Eric Jones
SAMPLING METHOD: S/S	LOGGED BY: S. Plum
BOREHOLE DIA.: 8"	WATER FOUND (ft-BGL): 18.8
DRILLING START: 10-12-98 1145	TOTAL DEPTH (ft-BGL): 19
DRILLING END:	FINAL COMPLETION DATE:

SAMPLE INTERVAL	RECOVERY	HNU SCAN (ppm)	LITHOLOGIC DESCRIPTION	HNU OVA HDSP (ppm)	SAMPLE INFO.	COMMENTS
			0-15 - Overdrill. HARD DRILLING			
	0.4	10 14 6	15-17 - Clay, sme pebble-sized gravel, moist, plastic, m. SL. gy. 10YR 5/1			
	2.0		17-18.8 Clay as above..		Sample	
			18.8-19 Gravel, chert, angular & broken, flat pieces. Saturated, loose, non plastic.. 10YR 6/4		FC2-SB11-18.5 VOC, SVOC, TPH	

Routing:
IRPIMS Project Manager
Drum Manager & IRPIMS Contractor
IN TURN

PROJECT TITLE: Basewide Remedial Assessment for 1997
PROJECT NUMBER: MBPB 97-7895
CONTRACT NUMBER: F41650-95-D-2005-5024
SUBTASK 3.2, SOW PARAGRAPH: 7.3.2.1.1

Task Order for IRPIMS Location Identifiers and Container Labels

Requestor	Luis J. Medina	Date	2-Jun-98	Task Order #	514	Assigned by	JG
Project Name	Soil Sampling at Site Fc-2			Date Task Assigned	6-2	Date Needed By	6-5-98
Report Title	Confirmation Sampling & Analysis Plan For Irp Site Fc-2			EMRO Assigned QC ID Number		171.001	
Contractor	PARSONS ENG.	Contractor Phone #	512-719-6000	Date Started	3 JUN 1998	Date Completed	3 JUN 1998
Contractor POC	Brian Vanderglass	Subcontractor	JEDI	Hours Used	1.0		
Contract #		Delivery Order #	0	PKOV Buyer	ms. sharon money (ARCE)		
Field Work Phase Est. Start	8-Jun-98	Est. End	12-Jun-98				

Zone	Site	Site IRPIMS #	Location Type*	# of Loc.	Est. # Containers Per Loc.	Est. Total # Containers	Container Size & Type	Container Contents	Contents Haz or Nonhaz	First Container #	Last Container #
2	FC-2	FT024	SOIL BORING	11	1	11	55 gal drums	soil cuttings			

☐ These areas are not to be filled out by the TPM.

* If location is to become a well, do not request a number for a soil boring (SB). See TSD table C-4 for a list of types.

REQUEST FOR IRPIMS LOCATION IDENTIFIERS

FILLED OUT BY PROJECT MANAGER

REQUESTOR'S NAME	Luis Medina
DATE REQUESTED	2 JUN 1998
PROJECT TITLE	Confirmation Sampling & Analysis Plan for IRP Site FC-2
PHASE OR CALL ORDER	—
CONTRACTOR	Parsons ES
SITE	FC-2

FILLED OUT BY DATA MANAGER

ASSIGNED BY	Brian Collingham
DATE ASSIGNED	3 JUN 1998
PROJECT ID NUMBER	171
QCID NUMBER	171.001
SITE WIMS-ES NUMBER	FT024
SITEID NUMBER	124

ITEM NO.	LOCATION TYPE	TEMP. ID NUMBER	MSLINK NUMBER	IRPIMS LOCID NO.
1	Soil Boring		124063	FT024SB063
2	Soil Boring		124064	FT024SB064
3	Soil Boring		124065	FT024SB065
4	Soil Boring		124066	FT024SB066
5	Soil Boring		124067	FT024SB067
6	Soil Boring		124068	FT024SB068
7	Soil Boring		124069	FT024SB069
8	Soil Boring		124070	FT024SB070
9	Soil Boring		124071	FT024SB071
10	Soil Boring		124072	FT024SB072
11	Soil Boring		124073	FT024SB073
12				
13				
14				
15				
16				
17				
18				
19				
20				

Groundwater Sampling Form

IRP Site FC-2

Kelly AFB, Texas

Well No. FT024MW002 (F202)

Well Purge Record

				Date	Time	Total Vol.	
Depth to Water	_____ (a)	Purge Start					
Total Well Depth	_____ (b)	Purge End				_____	gallons
Water Column	_____ (b-a)	Purge Start					
1 Purge Volume*	_____ (d)	Purge End				_____	gallons
3 Purge Volumes	_____ (d * 3)	Purge Start					
5 Purge Volumes	_____ (d * 5)	Purge End				_____	gallons

*1 Purge Volume = ([TD - DTW] x 0.16)

Assumes 2" diameter well

Oily Sheen.

Date	Time	Volume (gallons)	pH	Cond. (uS/cm)	Temp. (degrees C)	Redox (mV)	Diss. Oxy (mg/L)	Comment
6-7-95								
	1625	0	7.68	1025	29.2	66.3		Murky
	1634	5	7.53	990	28.7	-19.8		Murky
	1640	10	7.28	910	28.7	-34.3		
	1643	13	6.94	970	25.7	-112.4		Gray sediment
	1646	15	6.91	980	25.5	-116.4		
	1650	16.5	6.89	980	25.3	-116.7		
							0.32	
		Meter Type						

Hach Mobile Laboratory Results

Date	Time	Test	Method	Hach Test	Standard	Dilution	Result	Unit
		Fe, Total	8008	50.04.1				
		Fe, Ferrous	8146	50.02.1	N/A			
		Fe, Ferric	(Total - Ferrous)		N/A			
		Nitrate	8039	50.06.1				
		Nitrite	8509	50.09.1	N/A			
		Sulfate	8051	45.000				
		Sulfide	8131	61.12.1	N/A			

Hach Field Testing

IRP Site FC-2

Kelly AFB, Texas

Well No. FT024MW002 (F202)

Sample Preparation

Date Collected 6/9/95 | Time Filtered _____ | Apperance _____

Time Collected _____ | Volume Filtered _____ | Odor _____

Fe, Total (50.04.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)

1715 Sample/Reagent Mix

_____ Run Standard — Standard Conc. _____ mg/L — Result _____ mg/L

_____ Run Sample — olorimeter Result _____ mg/L — Adjusted Result _____ mg/L

Fe, Ferrous (50.02.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1

1715 Sample/Reagent Mix

1725 Run Sample — olorimeter Result 3.65 mg/L — Adjusted Result 3.65 mg/L

Fe, Ferric

_____ mg/L (Fe, Total) - _____ mg/L (Fe, Ferrous) =

_____ mg/L (Fe, Ferric)

Nitrate (50.06.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1

_____ Sample/Reagent Mix

1720 Run Standard — Standard Conc. _____ mg/L — Result _____ mg/L

1725 Run Sample — olorimeter Result 1.2 mg/L — Adjusted Result 1.2 mg/L

Nitrite (50.09.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1

1720 Sample/Reagent Mix

1730 Run Sample — olorimeter Result 0.004 mg/L — Adjusted Result 0.004 mg/L

Manganese (52.13.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
		No			1

1733	Sample/Reagent Mix					
	Run Standard	Standard Conc.	0.2	mg/L	Result	mg/L
1735	Run Sample	olorimeter Result	0.6	mg/L	Adjusted Result	0.6 mg/L

Sulfate (45.000+A25)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)

	Sample/Reagent Mix					
	Run Standard	Standard Conc.		mg/L	Result	mg/L
	Run Sample	olorimeter Result		mg/L	Adjusted Result	mg/L

Sulfide (61.12.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
		No			

1730	Sample/Reagent Mix					
1735	Run Sample	olorimeter Result	0.029	mg/L	Adjusted Result	0.029 mg/L

Carbon Dioxide

Time		Sample Volume		Range	# Drops of Sodium Hydroxide
	Run Sample		ml	Lo / Med / Hi	

circle one

	Drops NaOH	x	1.25	/ 2 /	5	=	mg/L

Alkalinity

Time		Sample Volume		Titrant Conc.	Digit Multiplier
	Run Sample		ml	0.16 / 1.6 H2SO4	

P Alkalinity			x		=		mg/L as CaCO3 P Alk.
	(digits required)		*(digit mult.)*				
	Tit. Endpoint						Range
Total Alkalinity	pH = 5.1		x		=		(30 mg/L)
	(digits required)		*(digit mult.)*				
	pH = 4.8		x		=		(150 mg/L)
	(digits required)		*(digit mult.)*				
	pH = 4.5		x		=		(500 mg/L)
	(digits required)		*(digit mult.)*				
			x		=		mg/L as CaCO3 Tot. Alk.
	(digits required)		*(digit mult.)*				

Groundwater Sampling Form

IRP Site FC-2

Kelly AFB, Texas

Well No. FT024MW003 (F203)

Well Purge Record

				Date	Time	Total Vol.	
Depth to Water	20.21	(a)	Purge Start				
Total Well Depth	25.4	(b)	Purge End				gallons
Water Column	5.19	(b-a)	Purge Start				
1 Purge Volume*		(d)	Purge End				gallons
3 Purge Volumes	2.6	(d * 3)	Purge Start				
5 Purge Volumes		(d * 5)	Purge End				gallons

5.19 / .5 / 2.6

*1 Purge Volume = ([TD - DTW] x 0.16)

Assumes 2" diameter well

Date	Time	Volume (gallons)	pH	Cond. (uS/cm)	~~Temp.~~ D.O mg/l (degrees C)	Redox (mV)	~~Diss. Oxy~~ Temp (mg/L) °C	Comment
6-9-98	1350	0	6.60	1240		-130.5	28.7	V. Cloudy HC odor
	1400	1	6.65	1260		-115.4	27.3	" Dry
	1410	2	6.72	1260		-118.7	27.2	" Dry
	1417	2.5	6.70	1260		-113.2	27.6	" Dry
					0.52			
		Meter Type						

Hach Mobile Laboratory Results

Date	Time	Test	Method	Hach Test	Standard	Dilution	Result	Unit
		Fe, Total	8008	50.04.1				
		Fe, Ferrous	8146	50.02.1	N/A			
		Fe, Ferric	(Total - Ferrous)		N/A			
		Nitrate	8039	50.06.1				
		Nitrite	8509	50.09.1	N/A			
		Sulfate	8051	45.000				
		Sulfide	8131	61.12.1	N/A			

1635 Sample for VOC & Sulfate

Hach Field Testing

IRP Site FC-2
Kelly AFB, Texas
Well No. FT024MW002 (F203)

Sample Preparation

Date Collected 6/9/98 | Time Filtered 1640 | Apperance clear
Time Collected 1635 | Volume Filtered 0.5 L | Odor SH foe 1

Fe, Total (50.04.1)

Time ____ Dilution Yes / No | ml Sample (ml) ____ | Vol. Water (ml) ____ | Dilution Factor (tot. vol/sample vol.) ____

____ Sample/Reagent Mix

____ Run Standard | Standard Conc. ____ mg/L | Result ____ mg/L

____ Run Sample | olorimeter Result ____ mg/L | Adjusted Result ____ mg/L

Fe, Ferrous (50.02.1)

Time ____ Dilution Yes / (No) | ml Sample (ml) ____ | Vol. Water (ml) ____ | Dilution Factor (tot. vol/sample vol.) 1

1645 ~~1645~~ Sample/Reagent Mix

1650 ~~1650~~ Run Sample | olorimeter Result 4.74 mg/L | Adjusted Result ____ mg/L

Fe, Ferric

____ mg/L (Fe, Total) - ____ mg/L (Fe, Ferrous) =
____ mg/L (Fe, Ferric)

Nitrate (50.06.1)

Time ____ Dilution Yes / No | ml Sample (ml) ____ | Vol. Water (ml) ____ | Dilution Factor (tot. vol/sample vol.) 1

1650 ~~1650~~ Sample/Reagent Mix

~~1655~~ Run Standard | Standard Conc. ____ mg/L | Result ____ mg/L

1655 ~~1655~~ Run Sample | olorimeter Result 1.3 mg/L | Adjusted Result 1.3 mg/L

Nitrite (50.09.1)

Time ____ Dilution Yes (No) | ml Sample (ml) ____ | Vol. Water (ml) ____ | Dilution Factor (tot. vol/sample vol.) ____

1645 ~~1645~~ Sample/Reagent Mix

1655 Run Sample | olorimeter Result 0.011 mg/L | Adjusted Result ____ mg/L

Manganese (52.13.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
		Yes / (No)			
1700 Sample/Reagent Mix					
Run Standard	Standard Conc.		mg/L	Result	mg/L
1705 Run Sample	olorimeter Result	2.4	mg/L	Adjusted Result	2.4 mg/L

Sulfate (45.000+A25)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
Sample/Reagent Mix					
Run Standard	Standard Conc.		mg/L	Result	mg/L
Run Sample	olorimeter Result		mg/L	Adjusted Result	mg/L

Sulfide (61.12.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
		Yes / (No)			
1705 Sample/Reagent Mix					
1710 Run Sample	olorimeter Result	0.004	mg/L	Adjusted Result	mg/L

Carbon Dioxide

Time		Sample Volume		Range	# Drops of Sodium Hydroxide
Run Sample			ml	Lo / Med / Hi	
				circle one	
	Drops NaOH	x	1.25 / 2 / 5 =		mg/L

Alkalinity

Time		Sample Volume		Titrant Conc.	Digit Multiplier
Run Sample			ml	0.16 / 1.6 H2SO4	
P Alkalinity		x		=	mg/L as CaCO3 P Alk.
	(digits required)		*(digit mult.)*		
	Tit. Endpoint				Range
Total Alkalinity	pH = 5.1	x		=	(30 mg/L)
	(digits required)		*(digit mult.)*		
	pH = 4.8	x		=	(150 mg/L)
	(digits required)		*(digit mult.)*		
	pH = 4.5	x		=	(500 mg/L)
	(digits required)		*(digit mult.)*		
		x		=	mg/L as CaCO3 Tot. Alk.
	(digits required)		*(digit mult.)*		

Groundwater Sampling Form

IRP Site FC-2

Kelly AFB, Texas

Well No. FT024MW004 (F204)

Well Purge Record

				Date	Time	Total Vol.	
Depth to Water		(a)	Purge Start				
Total Well Depth	30.2	(b)	Purge End				gallons
Water Column		(b-a)	Purge Start				
1 Purge Volume*		(d)	Purge End				gallons
3 Purge Volumes		(d * 3)	Purge Start				
5 Purge Volumes		(d * 5)	Purge End				gallons

*1 Purge Volume = ([TD - DTW] x 0.16)

Assumes 2" diameter well

Date	Time	Volume (gallons)	pH	Cond. (uS/cm)	Temp. (degrees C)	Redox (mV)	Diss. Oxy (mg/L)	Comment
6-9-95	1510	0	7.39	790	23.4	267.4		Black
	1515	5	7.02	820	22.0	89.8		Black
	1520	10	6.73	810	21.5	36.8		V. Turbid - Dark
	1522	15	6.49	800	21.3	-9.4		Turbid
	1526	20	6.42	800	21.3	-31.1		Sl Turbid
	1528	23	6.38	800	21.4	-34.1		Clear
	1530	26	6.38	800	21.3	-38.3		Clear
							0.83	
		Meter Type						

Hach Mobile Laboratory Results

Date	Time	Test	Method	Hach Test	Standard	Dilution	Result	Unit
		Fe, Total	8008	50.04.1				
		Fe, Ferrous	8146	50.02.1	N/A			
		Fe, Ferric	(Total - Ferrous)		N/A			
		Nitrate	8039	50.06.1				
		Nitrite	8509	50.09.1	N/A			
		Sulfate	8051	45.000				
		Sulfide	8131	61.12.1	N/A			

1545 Sample for VOC + Sulfide MS/MSD & Dup A

Hach Field Testing

IRP Site FC-2

Kelly AFB, Texas

Well No. FT024MW004 (F204)

Sample Preparation

Date Collected 6/9/98 | Time Filtered 1535 | Apperance Clear

Time Collected 1535 | Volume Filtered 1L | Odor V. light fuel

Fe, Total (50.04.1)

Time _____ Dilution Yes / No | ol Sample (ml) _____ | Vol. Water (ml) _____ | Dilution Factor (tot. vol/sample vol.) _____

_____ Sample/Reagent Mix

_____ Run Standard | Standard Conc. _____ mg/L | Result _____ mg/L

_____ Run Sample | olorimeter Result _____ mg/L | Adjusted Result _____ mg/L

Fe, Ferrous (50.02.1)

Time _____ Dilution Yes / (No) | ol Sample (ml) _____ | Vol. Water (ml) _____ | Dilution Factor (tot. vol/sample vol.) 1

✓ 1540 Sample/Reagent Mix

1545 Run Sample | olorimeter Result 1.22 mg/L | Adjusted Result 1.22 mg/L

Fe, Ferric

_____ mg/L (Fe, Total) - _____ mg/L (Fe, Ferrous) =

_____ mg/L (Fe, Ferric)

Nitrate (50.06.1)

Time _____ Dilution Yes / (No) | ol Sample (ml) _____ | Vol. Water (ml) _____ | Dilution Factor (tot. vol/sample vol.) _____

1542 Sample/Reagent Mix

_____ Run Standard | Standard Conc. _____ mg/L | Result _____ mg/L

✓ 1547 Run Sample | olorimeter Result 1.7 mg/L | Adjusted Result _____ mg/L

Nitrite (50.09.1)

Time _____ Dilution Yes / No | ol Sample (ml) _____ | Vol. Water (ml) _____ | Dilution Factor (tot. vol/sample vol.) 1

✓ 1545 Sample/Reagent Mix

1555 Run Sample | olorimeter Result 0.002 mg/L | Adjusted Result 0.002 mg/L

Manganese (52.13.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1
1550 Sample/Reagent Mix					
1' Run Standard		Standard Conc.		mg/L	Result mg/L
1555 Run Sample		olorimeter Result	0.4 mg/L	Adjusted Result	0.4 mg/L

Sulfate (45.000+A25)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
Sample/Reagent Mix					
Run Standard		Standard Conc.		mg/L	Result mg/L
Run Sample		olorimeter Result	mg/L	Adjusted Result	mg/L

Sulfide (61.12.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
1550 Sample/Reagent Mix					
~~1360~~ Run Sample		olorimeter Result	0.012 mg/L	Adjusted Result	mg/L

Carbon Dioxide

Time	Sample Volume	Range	# Drops of Sodium Hydroxide
Run Sample	ml	Lo / Med / Hi (circle one)	
Drops NaOH x	1.25 / 2 / 5 =		mg/L

Alkalinity

Time	Sample Volume	Titrant Conc.	Digit Multiplier
Run Sample	ml	0.16 / 1.6 H2SO4	

P Alkalinity _____ (digits required) x _____ (digit mult.) = _____ mg/L as CaCO3 P Alk.

	Tit. Endpoint				Range
Total Alkalinity	pH = 5.1	_____ (digits required) x	_____ (digit mult.) =	_____	(30 mg/L)
	pH = 4.8	_____ (digits required) x	_____ (digit mult.) =	_____	(150 mg/L)
	pH = 4.5	_____ (digits required) x	_____ (digit mult.) =	_____	(500 mg/L)

_____ (digits required) x _____ (digit mult.) = _____ mg/L as CaCO3 Tot. Alk.

Hach Field Testing

IRP Site FC-2

Kelly AFB, Texas

Well No. FT024MW004 (F204) - DUP

Sample Preparation

Date Collected 6/9/98 Time Filtered _____ Apperance _____

Time Collected 1545 Volume Filtered _____ Odor _____

Fe, Total (50.04.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)

_____ Sample/Reagent Mix

_____ Run Standard Standard Conc. _____ mg/L Result _____ mg/L

_____ Run Sample olorimeter Result _____ mg/L Adjusted Result _____ mg/L

Fe, Ferrous (50.02.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1

1540 Sample/Reagent Mix

1545 Run Sample olorimeter Result 1.16 mg/L Adjusted Result 1.16 mg/L

Fe, Ferric

_____ mg/L (Fe, Total) - _____ mg/L (Fe, Ferrous) =

_____ mg/L (Fe, Ferric)

Nitrate (50.06.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1

1542 Sample/Reagent Mix

_____ Run Standard Standard Conc. _____ mg/L Result _____ mg/L

1547 Run Sample olorimeter Result 1.4 mg/L Adjusted Result 1.4 mg/L

Nitrite (50.09.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1

1545 Sample/Reagent Mix

1555 Run Sample olorimeter Result 0.004 mg/L Adjusted Result 0.004 mg/L

1545 VOC, Sulfate & MS/MSD & ~~Dup~~ Dup A

Dup

MW- CC4

Manganese (52.13.1)

Time	Dilution	Yes / (No)	ol Sample (ml)		Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)	
						1	
1550	Sample/Reagent Mix						
	Run Standard	Standard Conc.		mg/L	Result		mg/L
1555	Run Sample	olorimeter Result	0.4	mg/L	Adjusted Result	0.4	mg/L

Sulfate (45.000+A25)

Time	Dilution	Yes / No	ol Sample (ml)		Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)	
	Sample/Reagent Mix						
	Run Standard	Standard Conc.		mg/L	Result		mg/L
	Run Sample	olorimeter Result		mg/L	Adjusted Result		mg/L

Sulfide (61.12.1)

Time	Dilution	Yes / No	ol Sample (ml)		Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)	
						1	
1550	Sample/Reagent Mix						
1600	Run Sample	olorimeter Result	0.014	mg/L	Adjusted Result	0.014	mg/L

Carbon Dioxide

Time		Sample Volume	Range	# Drops of Sodium Hydroxide	
	Run Sample		ml	Lo / Med / Hi (circle one)	
	Drops NaOH	x	1.25 / 2 / 5 =		mg/L

Alkalinity

Time		Sample Volume		Titrant Conc.	Digit Multiplier	
	Run Sample		ml	0.16 / 1.6 H2SO4		
P Alkalinity			x	=		mg/L as CaCO3 P Alk.
		(digits required)		(digit mult.)		
	Tit. Endpoint					Range
Total Alkalinity	pH = 5.1		x	=		(30 mg/L)
		(digits required)		(digit mult.)		
	pH = 4.8		x	=		(150 mg/L)
		(digits required)		(digit mult.)		
	pH = 4.5		x	=		(500 mg/L)
		(digits required)		(digit mult.)		
			x	=		mg/L as CaCO3 Tot. Alk.
		(digits required)		(digit mult.)		

el- 600

Sulfide - 0.8 ppt

Groundwater Sampling Form

IRP Site FC-2

Kelly AFB, Texas

Well No. FT024MW005 (F205)

Well Purge Record

				Date	Time	Total Vol.	
Depth to Water	18.39	(a)	Purge Start				
Total Well Depth		(b)	Purge End				gallons
Water Column		(b-a)	Purge Start				
1 Purge Volume*		(d)	Purge End				gallons
3 Purge Volumes		(d * 3)	Purge Start				
5 Purge Volumes		(d * 5)	Purge End				gallons

*1 Purge Volume = ([TD - DTW] x 0.16)

Assumes 2" diameter well

Breathing Space - 0.0 Wellhead - 0.2 ppm

Date	Time	Volume (gallons)	pH	Cond. (uS/cm)	Temp. (degrees C)	Redox (mV)	Diss. Oxy (mg/L)	Comment
6-9-98	0945	0	6.52	170930	24.9	~~10~~ -10.6		Sl. murky *
	0950	5	6.69	130890	24.7	-41.1		clear
	0954	10	6.75	150880	24.7	-76.1		clear
	0957	15	6.78	880	24.4	-119.8		clear
	1001	20	6.77	880	24.4	-148.8		clear
	1004	25	6.75	880	24.5	-153.1		clear
	1007	30	6.75	880	24.4	-202.7		clear HC odor increasing
	1010	35	6.75	880	24.4	-216.8		
							0.37	
		Meter Type						

Hach Mobile Laboratory Results

Date	Time	Test	Method	Hach Test	Standard	Dilution	Result	Unit
		Fe, Total	8008	50.04.1				
		Fe, Ferrous	8146	50.02.1	N/A			
		Fe, Ferric	(Total - Ferrous)		N/A			
		Nitrate	8039	50.06.1				
		Nitrite	8509	50.09.1	N/A			
		Sulfate	8051	45.000				
		Sulfide	8131	61.12.1	N/A			

* Sl HC odor - no sheen

Sample Vol sd Sulfide @ 1030 AM

Hach Field Testing

IRP Site FC-2
Kelly AFB, Texas
Well No. FT024MW005 (F205)

Sample Preparation

Date Collected 6/9/98 | Time Filtered 1015 | Apperance clear
Time Collected 1015 | Volume Filtered 1L | Odor moderate fuels

Fe, Total (50.04.1)

Time _____ Dilution Yes / No | ml Sample (ml) _____ | Vol. Water (ml) _____ | Dilution Factor (tot. vol/sample vol.) _____

_____ Sample/Reagent Mix

_____ Run Standard | Standard Conc. _____ mg/L | Result _____ mg/L

_____ Run Sample | Colorimeter Result _____ mg/L | Adjusted Result _____ mg/L

Fe, Ferrous (50.02.1)

Time _____ Dilution Yes (No) | ml Sample (ml) _____ | Vol. Water (ml) _____ | Dilution Factor (tot. vol/sample vol.) X

_____ Sample/Reagent Mix

1020 Run Sample | Colorimeter Result 3.86 mg/L | Adjusted Result X mg/L

Fe, Ferric

_____ mg/L (Fe, Total) - _____ mg/L (Fe, Ferrous) =
_____ mg/L (Fe, Ferric)

Nitrate (50.06.1)

Time _____ Dilution Yes / (No) | ml Sample (ml) _____ | Vol. Water (ml) _____ | Dilution Factor (tot. vol/sample vol.) 1

_____ Sample/Reagent Mix

_____ Run Standard | Standard Conc. 0.5 mg/L | Result 2.8 mg/L

1025 Run Sample | Colorimeter Result 2.3 mg/L | Adjusted Result 2.3 mg/L

Nitrite (50.09.1)

Time _____ Dilution Yes / (No) | ml Sample (ml) _____ | Vol. Water (ml) _____ | Dilution Factor (tot. vol/sample vol.) X

_____ Sample/Reagent Mix

1030 Run Sample | Colorimeter Result 0.001 mg/L | Adjusted Result X mg/L

Manganese (52.13.1)

Time	Dilution	Yes / (No)	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1

Sample/Reagent Mix

Run Standard — Standard Conc. _____ mg/L — Result _____ mg/L

1020 Run Sample — olorimeter Result 0.7 mg/L — Adjusted Result 0.7 mg/L

Sulfate (45.000+A25)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)

Sample/Reagent Mix

Run Standard — Standard Conc. _____ mg/L — Result _____ mg/L

Run Sample — olorimeter Result _____ mg/L — Adjusted Result _____ mg/L

Sulfide (61.12.1)

Time	Dilution	Yes / (No)	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
—					X

Sample/Reagent Mix

1030 Run Sample — olorimeter Result 0.016 mg/L — Adjusted Result X mg/L

Carbon Dioxide

Time		Sample Volume		Range	# Drops of Sodium Hydroxide
	Run Sample	_____	ml	Lo / Med / Hi (circle one)	_____

_____ Drops NaOH x 1.25 / 2 / 5 = _____ mg/L

Alkalinity

Time		Sample Volume		Titrant Conc.	Digit Multiplier
	Run Sample	_____	ml	0.16 / 1.6 H2SO4	_____

P Alkalinity _____ (digits required) x _____ (digit mult.) = _____ mg/L as CaCO3 P Alk.

	Tit. Endpoint					Range
Total Alkalinity	pH = 5.1	_____ (digits required)	x	_____ (digit mult.)	=	_____ (30 mg/L)
	pH = 4.8	_____ (digits required)	x	_____ (digit mult.)	=	_____ (150 mg/L)
	pH = 4.5	_____ (digits required)	x	_____ (digit mult.)	=	_____ (500 mg/L)

_____ (digits required) x _____ (digit mult.) = _____ mg/L as CaCO3 Tot. Alk.

Groundwater Sampling Form

IRP Site FC-2

Kelly AFB, Texas

Well No. WP022MW009 (E309)

Well Purge Record

				Date	Time	Total Vol.	
Depth to Water	_____ (a)		Purge Start	_____	_____		
Total Well Depth	22.4 (b)		Purge End	_____	_____	_____	gallons
Water Column	_____ (b-a)		Purge Start	_____	_____		
1 Purge Volume*	_____ (d)		Purge End	_____	_____	_____	gallons
3 Purge Volumes	_____ (d * 3)		Purge Start	_____	_____		
5 Purge Volumes	_____ (d * 5)		Purge End	_____	_____	_____	gallons

*1 Purge Volume = ([TD - DTW] x 0.16)

Assumes 2" diameter well

Date	Time	Volume (gallons)	pH	Cond. (uS/cm)	Temp. (degrees C)	Redox (mV)	Diss. Oxy (mg/L)	Comment
6-7-98	1425	0	7.80	830	26.0	-17.7		Sl. Turbid
	1435	5	7.80	830	26.0	-95.5		"
	1440	10	7.09	830	22.6	-111.5		"
	1446	15	7.09	830	22.6	-110.2		"
	1450	20	7.13	830	22.6	-113.8		"
							0.51	
		Meter Type						

Hach Mobile Laboratory Results

Date	Time	Test	Method	Hach Test	Standard	Dilution	Result	Unit
		Fe, Total	8008	50.04.1				
		Fe, Ferrous	8146	50.02.1	N/A			
		Fe, Ferric	(Total - Ferrous)		N/A			
		Nitrate	8039	50.06.1				
		Nitrite	8509	50.09.1	N/A			
		Sulfate	8051	45.000				
		Sulfide	8131	61.12.1	N/A			

Simple VOC & Sulfides @ 1450

Hach Field Testing

IRP Site FC-2
Kelly AFB, Texas
Well No. WP022MW009 (E309)

Sample Preparation

Date Collected 6/10/98 (D)
Time Collected 1445
Time Filtered 1445
Volume Filtered 1L
Apperance clear
Odor MODERATE

Fe, Total (50.04.1)

Time _____ Dilution Yes / No
ol Sample (ml) _____
Vol. Water (ml) _____
Dilution Factor (tot. vol/sample vol.) _____
_____ Sample/Reagent Mix
_____ Run Standard Standard Conc. _____ mg/L Result _____ mg/L
_____ Run Sample olorimeter Result _____ mg/L Adjusted Result _____ mg/L

Fe, Ferrous (50.02.1)

Time _____ Dilution (Yes) No
ol Sample (ml) _____
Vol. Water (ml) _____
Dilution Factor (tot. vol/sample vol.) 2
1438 Sample/Reagent Mix
1431 Run Sample olorimeter Result 3.40 mg/L Adjusted Result 6.8 mg/L

Fe, Ferric

_____ mg/L (Fe, Total) - _____ mg/L (Fe, Ferrous) =
_____ mg/L (Fe, Ferric)

Nitrate (50.06.1)

Time _____ Dilution (Yes) / No
ol Sample (ml) _____
Vol. Water (ml) _____
Dilution Factor (tot. vol/sample vol.) 2
1440 Sample/Reagent Mix
_____ Run Standard Standard Conc. _____ mg/L Result _____ mg/L
1445 Run Sample olorimeter Result 1.0 mg/L Adjusted Result 2.0 mg/L

Nitrite (50.09.1)

Time _____ Dilution Yes (No)
ol Sample (ml) _____
Vol. Water (ml) _____
Dilution Factor (tot. vol/sample vol.) 1
1505 Sample/Reagent Mix
1515 Run Sample olorimeter Result 0.008 mg/L Adjusted Result 0.008 mg/L

Manganese (52.13.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
		No			
1500	Sample/Reagent Mix				
	Run Standard	Standard Conc.		mg/L	Result mg/L
1505	Run Sample	olorimeter Result	0.0 mg/L	Adjusted Result	0.0 mg/L

Sulfate (45.000+A25)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
	Sample/Reagent Mix				
	Run Standard	Standard Conc.		mg/L	Result mg/L
	Run Sample	olorimeter Result	mg/L	Adjusted Result	mg/L

Sulfide (61.12.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
		No			1
1505	Sample/Reagent Mix				
1517	Run Sample	olorimeter Result	0.019 mg/L	Adjusted Result	0.019 mg/L

Carbon Dioxide

Time		Sample Volume		Range	# Drops of Sodium Hydroxide
	Run Sample		ml	Lo / Med / Hi (circle one)	
	Drops NaOH	x	1.25 / 2 / 5	=	mg/L

Alkalinity

Time		Sample Volume		Titrant Conc.	Digit Multiplier
	Run Sample		ml	0.16 / 1.6 H2SO4	
P Alkalinity	(digits required)	x	(digit mult.)	=	mg/L as CaCO3 P Alk.
	Tit. Endpoint				Range
Total Alkalinity	pH = 5.1	(digits required) x	(digit mult.)	=	(30 mg/L)
	pH = 4.8	(digits required) x	(digit mult.)	=	(150 mg/L)
	pH = 4.5	(digits required) x	(digit mult.)	=	(500 mg/L)
	(digits required)	x	(digit mult.)	=	mg/L as CaCO3 Tot. Alk.

Groundwater Sampling Form

IRP Site FC-2

Kelly AFB, Texas

Well No. ST10MW019 (TC11)

Well Purge Record

				Date	Time	Total Vol.	
Depth to Water	~~14.66~~	(a) 19.00	Purge Start	6-9-98	10:55		
Total Well Depth	~~24.4~~	(b) 23.92	Purge End				gallons
Water Column		(b-a)	Purge Start				
1 Purge Volume*		(d)	Purge End				gallons
3 Purge Volumes		(d * 3)	Purge Start				
5 Purge Volumes		(d * 5)	Purge End				gallons

*1 Purge Volume = ([TD - DTW] x 0.16)

Assumes 2" diameter well

No HC odor

Date	Time	Volume (gallons)	pH	Cond. (uS/cm)	Temp. (degrees C)	Redox (mV)	Diss. Oxy (mg/L)	Comment
~~6-9-98~~	~~1042~~	3	6.94	900	24.7	41.4		
6-9-98	1055	0	7.24	830	23.9	-25.1		Brown, Murky
	1100	5	6.88	830	21.9	-56.4		Sl. HC odor-Turb.d
	1105	10	6.88	830	21.9	-82.9		Murky - Sl turbid
	1109	15	6.67	830	21.5	-92.4		
	1114	20	6.65	830	21.5	-102.7		
	1118	25	6.65	830	21.5	-106.3		
							0.51	
		Meter Type						

Hach Mobile Laboratory Results

Date	Time	Test	Method	Hach Test	Standard	Dilution	Result	Unit
		Fe, Total	8008	50.04.1				
		Fe, Ferrous	8146	50.02.1	N/A			
		Fe, Ferric	(Total - Ferrous)		N/A			
		Nitrate	8039	50.06.1				
		Nitrite	8509	50.09.1	N/A			
		Sulfate	8051	45.000				
		Sulfide	8131	61.12.1	N/A			

Sample VOC, methane, Sulfate @ 1140

Hach Field Testing

IRP Site FC-2

Kelly AFB, Texas

Well No. ST10MW019 (TC11)

Sample Preparation

Date Collected	6/9/98	Time Filtered	1120	Apperance	clear
Time Collected	1120	Volume Filtered	1 L	Odor	slt fuel

Fe, Total (50.04.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)

Sample/Reagent Mix

Run Standard — Standard Conc. _____ mg/L — Result _____ mg/L

Run Sample — olorimeter Result _____ mg/L — Adjusted Result _____ mg/L

Fe, Ferrous (50.02.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
		No			1

1119 Sample/Reagent Mix

1121 Run Sample — olorimeter Result 4.98 mg/L — Adjusted Result 4.98 mg/L

Fe, Ferric

_____ mg/L (Fe, Total) - _____ mg/L (Fe, Ferrous) =

_____ mg/L (Fe, Ferric)

Nitrate (50.06.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
		No			1

1125 Sample/Reagent Mix

~~1125~~ Run Standard — Standard Conc. _____ mg/L — Result _____ mg/L

1130 Run Sample — olorimeter Result 1.0 mg/L — Adjusted Result 1.0 mg/L

Nitrite (50.09.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
		No			1

1125 Sample/Reagent Mix

1135 Run Sample — olorimeter Result 0.004 mg/L — Adjusted Result 0.004 mg/L

Manganese (52.13.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1

1129 Sample/Reagent Mix

0 Run Standard — Standard Conc. _____ mg/L — Result _____ mg/L

1133 Run Sample — olorimeter Result 1.3 mg/L — Adjusted Result 1.3 mg/L

Sulfate (45.000+A25)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)

_____ Sample/Reagent Mix

_____ Run Standard — Standard Conc. _____ mg/L — Result _____ mg/L

_____ Run Sample — olorimeter Result _____ mg/L — Adjusted Result _____ mg/L

Sulfide (61.12.1)

Time	Dilution	Yes / No	ol Sample (ml)	Vol. Water (ml)	Dilution Factor (tot. vol/sample vol.)
					1

1132 Sample/Reagent Mix

1137 Run Sample — olorimeter Result ~~0.016~~ 0.024 mg/L — Adjusted Result 0.024 mg/L

Carbon Dioxide

Time		Sample Volume		Range	# Drops of Sodium Hydroxide
	Run Sample	_____	ml	Lo / Med / Hi (circle one)	_____

_____ Drops NaOH x 1.25 / 2 / 5 = _____ mg/L

Alkalinity

Time		Sample Volume		Titrant Conc.	Digit Multiplier
	Run Sample	_____	ml	0.16 / 1.6 H2SO4	_____

P Alkalinity _____ (digits required) x _____ (digit mult.) = _____ mg/L as CaCO3 P Alk.

	Tit. Endpoint					Range
Total Alkalinity	pH = 5.1	_____ (digits required)	x	_____ (digit mult.)	=	_____ (30 mg/L)
	pH = 4.8	_____ (digits required)	x	_____ (digit mult.)	=	_____ (150 mg/L)
	pH = 4.5	_____ (digits required)	x	_____ (digit mult.)	=	_____ (500 mg/L)

_____ (digits required) x _____ (digit mult.) = _____ mg/L as CaCO3 Tot. Alk.

Solution Standards
IRP Site FC-2
Kelly AFB, Texas

Daily Standard Preparation

	Standard Conc. (mg/L)	*Standard Volume (ml)*	*DI Water Added (ml)*	*Diluted Standard Solution (mg/L)*	*Hach Test Result (mg/L)*
Example	*25*	*2*	*48*	*(2/50) x 25 = 1.0*	*0.98*
Fe, Total					
Nitrate	5	2	18	2/20 x 5 = 0.5	0.6
Manganese	10	4	~~25~~ 21	4/25 x 10 = 1.6	1.6
Sulfate					

APPENDIX C
LABORATORY ANALYTICAL RESULTS

SPECIALIZED ASSAYS INC. • 2960 Foster Creighton Dr. • P.O. Box 40566 • Nashville, Tennessee 37204-0566
615-726-0177 • 1-800-765-0980 • Fax 615-726-3404

Case Narrative
SDG 103345
(8/7/98)

Client: **Parsons Engineering Sciences, Inc.**
1700 Broadway, Suite 900
Denver, Colorado 80290

Client Project Number: 726876.19122 **Matrix: Water**

Laboratory Project Number: 103345 **Number of Samples: 10 Water**

Date Received: 6/10/98 **Date Collected: 6/9/98**

Sample Receipt

Ten soil samples were received in good condition at 4° C on 6/10/98. The analysis requested included volatile organic compounds (VOCs), sulfate and methane. All analysis was conducted following Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846). Specific methods used include the following:

SW-846 Method 8260B, VOCs
SW-846 Method 8015M, methane
SW-846 Method 9056, sulfate

Volatile Organic Compounds, Method 8260B

All instrument calibrations, internal standards, and surrogate results associated with the samples were within method or laboratory acceptance criteria. The sample was analyzed as part of analytical batch 9104.

Matrix spike/matrix spike duplicate (MS/MSD) analysis was conducted on sample TC-11. All MS and MSD sample exhibited acceptable recoveries for all spike compounds and all relative percent difference (RPD) values. All compounds were within acceptable limits for the laboratory control standard (LCS).

Sample quantitation was conducted using relative response factors for all compounds with relative standard deviations (RSDs) equal to or less than 15% for all non-calibration check compounds. If the RSD exceeded 15%, calibration curves were used for sample quantitation. Copies of the curves generated for all compounds with RSDs greater than 15% have been supplied.

Methane, Method 8015B

The samples were analyzed as one analytical batch the batch is 103345. All instrument calibration was within method or laboratory acceptance criteria.

MS/MSD analysis was conducted on laboratory blank spike pair. MS/MSD recoveries and RPD values were acceptable. Laboratory control sample exhibited acceptable recovery.

Sulfate, Method 9056

All calibration, MS/MSD and laboratory control sample results were within laboratory or method specified limits.

Paula Watts
Technical Services
Specialized Assays, Inc

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FCO24MW005

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: 98-A66321
Date Sampled:: 6/ 9/98
Date Received: 6/10/98
Analysis Date: 6/15/98
Analysis Time: 2:27
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
71-43-2	Benzene	0.4	U
108-86-1	Bromobenzene	0.3	U
74-97-5	Bromochloromethane	0.4	U
75-25-2	Bromoform	1.2	U
74-83-9	Bromomethane	1.1	U
104-51-8	n-Butylbenzene	1.1	U
135-98-8	sec-Butylbenzene	1.3	U
98-06-6	t-Butylbenzene	1.4	U
56-23-5	Carbon tetrachloride	2.1	U
108-90-7	Chlorobenzene	0.4	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	0.3	U
74-87-3	Chloromethane	1.3	U
95-49-8	2-Chlorotoluene	0.4	U
106-43-4	4-Chlorotoluene	0.6	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	U
124-48-1	Dibromochloromethane	0.5	U
74-95-3	1,2-Dibromoethane	0.6	U
74-95-3	Dibromomethane	2.4	U
95-50-1	1,2-Dichlorobenzene	0.3	U
541-73-1	1,3-Dichlorobenzene	1.2	U
106-46-7	1,4-Dichlorobenzene	0.3	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	0.4	U
107-06-2	1,2-Dichloroethane	0.6	U
75-35-4	1,1-Dichloroethene	1.2	U
156-59-2	cis-1,2-Dichloroethene	1.2	U
156-60-5	trans-1,2-Dichloroethene	0.6	U
78-87-5	1,2-Dichloropropane	0.4	U
142-28-9	1,3-Dichloropropane	0.4	U
594-20-7	2,2-Dichloropropane	3.5	U
563-58-6	1,1-Dichloropropene	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	0.6	U
87-68-3	Hexachlorobutadiene	1.1	U
98-82-8	Isopropylbenzene	0.5	U
99-87-6	4-Isopropyltoluene	1.2	U
75-09-2	Methylene chloride	0.3	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC024MW005

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A66321
Date Sampled:: 6/ 9/98
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
91-20-3	Naphthalene	0.4	....	U
103-65-1	n-Propylbenzene	0.4	....	U
100-42-5	Styrene	0.4	....	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	....	U
127-18-4	Tetrachloroethene	1.4	....	U
108-88-3	Toluene	1.1	....	U
87-61-6	1,2,3-Trichlorobenzene	0.3	....	U
120-82-1	1,2,4-Trichlorobenzene	0.4	....	U
71-55-6	1,1,1-Trichloroethane	0.8	....	U
79-00-5	1,1,2-Trichloroethane	1.0	....	U
79-01-6	Trichloroethene	1.0	....	U
96-18-4	1,2,3-Trichloropropane	3.2	....	U
95-63-6	1,2,4-Trimethylbenzene	1.3	....	U
108-67-8	1,3,5-Trimethylbenzene	0.5	....	U
75-01-4	Vinyl chloride	1.1	....	U
75-27-4	Bromodichloromethane	0.8	....	U
95-47-6	o-Xylene	3.0	....	U
108-38-3	m,p-Xylene	4.0	....	U
75-69-4	Trichlorofluoromethane	0.8	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

TRIP BLANK

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: 98-A66322
Date Sampled::
Date Received: 6/10/98
Analysis Date: 6/15/98
Analysis Time: 4:56
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

TRIP BLANK

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A66322
Date Sampled::
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
91-20-3	Naphthalene	0.4	U
103-65-1	n-Propylbenzene	0.4	U
100-42-5	Styrene	0.4	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	U
127-18-4	Tetrachloroethene	1.4	U
108-88-3	Toluene	1.1	U
87-61-6	1,2,3-Trichlorobenzene	0.3	U
120-82-1	1,2,4-Trichlorobenzene	0.4	U
71-55-6	1,1,1-Trichloroethane	0.8	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	3.2	U
95-63-6	1,2,4-Trimethylbenzene	1.3	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
75-01-4	Vinyl chloride	1.1	U
75-27-4	Bromodichloromethane	0.8	U
95-47-6	o-Xylene	3.0	U
108-38-3	m,p-Xylene	4.0	U
75-69-4	Trichlorofluoromethane	0.8	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

TC11

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: 98-A66323
Date Sampled:: 6/ 9/98
Date Received: 6/10/98
Analysis Date: 6/15/98
Analysis Time: 5:34
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U

000018

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

TC11

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A66323
Date Sampled:: 6/ 9/98
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
91-20-3	Naphthalene	0.4	....	U
103-65-1	n-Propylbenzene	0.4	....	U
100-42-5	Styrene	0.4	....	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	....	U
127-18-4	Tetrachloroethene	1.4	....	U
108-88-3	Toluene	1.1	....	U
87-61-6	1,2,3-Trichlorobenzene	0.3	....	U
120-82-1	1,2,4-Trichlorobenzene	0.4	....	U
71-55-6	1,1,1-Trichloroethane	0.8	....	U
79-00-5	1,1,2-Trichloroethane	1.0	....	U
79-01-6	Trichloroethene	1.0	....	U
96-18-4	1,2,3-Trichloropropane	3.2	....	U
95-63-6	1,2,4-Trimethylbenzene	1.3	....	U
108-67-8	1,3,5-Trimethylbenzene	0.5	....	U
75-01-4	Vinyl chloride	1.1	....	U
75-27-4	Bromodichloromethane	0.8	....	U
95-47-6	o-Xylene	3.0	....	U
108-38-3	m,p-Xylene	4.0	....	U
75-69-4	Trichlorofluoromethane	0.8	....	U

000019

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

WP022-MW009

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: 98-A66324
Date Sampled:: 6/ 9/98
Date Received: 6/10/98
Analysis Date: 6/15/98
Analysis Time: 8:03
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U

000022

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

WP022-MW009

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A66324
Date Sampled:: 6/ 9/98
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
91-20-3	Naphthalene	0.4	U
103-65-1	n-Propylbenzene	0.4	U
100-42-5	Styrene	0.4	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	U
127-18-4	Tetrachloroethene	1.4	U
108-88-3	Toluene	1.1	U
87-61-6	1,2,3-Trichlorobenzene	0.3	U
120-82-1	1,2,4-Trichlorobenzene	0.4	U
71-55-6	1,1,1-Trichloroethane	0.8	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	3.2	U
95-63-6	1,2,4-Trimethylbenzene	1.3	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
75-01-4	Vinyl chloride	1.1	U
75-27-4	Bromodichloromethane	0.8	U
95-47-6	o-Xylene	3.0	U
108-38-3	m,p-Xylene	4.0	U
75-69-4	Trichlorofluoromethane	0.8	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC24MW004

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: 98-A66325
Date Sampled:: 6/ 9/98
Date Received: 6/10/98
Analysis Date: 6/15/98
Analysis Time: 8:40
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U

000026

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC24MW004

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A66325
Date Sampled:: 6/ 9/98
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
91-20-3	Naphthalene	0.4	....	U
103-65-1	n-Propylbenzene	0.4	....	U
100-42-5	Styrene	0.4	....	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	....	U
127-18-4	Tetrachloroethene	1.4	....	U
108-88-3	Toluene	1.1	....	U
87-61-6	1,2,3-Trichlorobenzene	0.3	....	U
120-82-1	1,2,4-Trichlorobenzene	0.4	....	U
71-55-6	1,1,1-Trichloroethane	0.8	....	U
79-00-5	1,1,2-Trichloroethane	1.0	....	U
79-01-6	Trichloroethene	1.0	....	U
96-18-4	1,2,3-Trichloropropane	3.2	....	U
95-63-6	1,2,4-Trimethylbenzene	1.3	....	U
108-67-8	1,3,5-Trimethylbenzene	0.5	....	U
75-01-4	Vinyl chloride	1.1	....	U
75-27-4	Bromodichloromethane	0.8	....	U
95-47-6	o-Xylene	30.0	....	U
108-38-3	m,p-Xylene	4.0	....	U
75-69-4	Trichlorofluoromethane	0.8	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

DUP-A

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: 98-A66326
Date Sampled:: 6/ 9/98
Date Received: 6/10/98
Analysis Date: 6/15/98
Analysis Time: 9:17
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

DUP-A

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A66326
Date Sampled:: 6/ 9/98
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
91-20-3	Naphthalene	0.4	U
103-65-1	n-Propylbenzene	0.4	U
100-42-5	Styrene	0.4	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	U
127-18-4	Tetrachloroethene	1.4	U
108-88-3	Toluene	1.1	U
87-61-6	1,2,3-Trichlorobenzene	0.3	U
120-82-1	1,2,4-Trichlorobenzene	0.4	U
71-55-6	1,1,1-Trichloroethane	0.8	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	3.2	U
95-63-6	1,2,4-Trimethylbenzene	1.3	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
75-01-4	Vinyl chloride	1.1	U
75-27-4	Bromodichloromethane	0.8	U
95-47-6	o-Xylene	3.0	U
108-38-3	m,p-Xylene	4.0	U
75-69-4	Trichlorofluoromethane	0.8	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FCO24MWOO3

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: 98-A66327
Date Sampled:: 6/ 9/98
Date Received: 6/10/98
Analysis Date: 6/15/98
Analysis Time: 9:54
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
71-43-2	Benzene	0.4	U
108-86-1	Bromobenzene	0.3	U
74-97-5	Bromochloromethane	0.4	U
75-25-2	Bromoform	1.2	U
74-83-9	Bromomethane	1.1	U
104-51-8	n-Butylbenzene	1.1	U
135-98-8	sec-Butylbenzene	1.3	U
98-06-6	t-Butylbenzene	1.4	U
56-23-5	Carbon tetrachloride	2.1	U
108-90-7	Chlorobenzene	0.4	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	0.3	U
74-87-3	Chloromethane	1.3	U
95-49-8	2-Chlorotoluene	0.4	U
106-43-4	4-Chlorotoluene	0.6	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	U
124-48-1	Dibromochloromethane	0.5	U
74-95-3	1,2-Dibromoethane	0.6	U
74-95-3	Dibromomethane	2.4	U
95-50-1	1,2-Dichlorobenzene	0.3	U
541-73-1	1,3-Dichlorobenzene	1.2	U
106-46-7	1,4-Dichlorobenzene	0.3	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	0.4	U
107-06-2	1,2-Dichloroethane	0.6	U
75-35-4	1,1-Dichloroethene	1.2	U
156-59-2	cis-1,2-Dichloroethene	1.2	U
156-60-5	trans-1,2-Dichloroethene	0.6	U
78-87-5	1,2-Dichloropropane	0.4	U
142-28-9	1,3-Dichloropropane	0.4	U
594-20-7	2,2-Dichloropropane	3.5	U
563-58-6	1,1-Dichloropropene	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	0.6	U
87-68-3	Hexachlorobutadiene	1.1	U
98-82-8	Isopropylbenzene	0.5	U
99-87-6	4-Isopropyltoluene	1.2	U
75-09-2	Methylene chloride	0.3	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC024MW003

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A66327
Date Sampled:: 6/ 9/98
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
91-20-3	Naphthalene	0.4	....	U
103-65-1	n-Propylbenzene	0.4	....	U
100-42-5	Styrene	0.4	....	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	....	U
127-18-4	Tetrachloroethene	1.4	....	U
108-88-3	Toluene	1.1	....	U
87-61-6	1,2,3-Trichlorobenzene	0.3	....	U
120-82-1	1,2,4-Trichlorobenzene	0.4	....	U
71-55-6	1,1,1-Trichloroethane	0.8	....	U
79-00-5	1,1,2-Trichloroethane	1.0	....	U
79-01-6	Trichloroethene	1.0	....	U
96-18-4	1,2,3-Trichloropropane	3.2	....	U
95-63-6	1,2,4-Trimethylbenzene	1.3	....	U
108-67-8	1,3,5-Trimethylbenzene	0.5	....	U
75-01-4	Vinyl chloride	1.1	....	U
75-27-4	Bromodichloromethane	0.8	....	U
95-47-6	o-Xylene	3.0	....	U
108-38-3	m,p-Xylene	4.0	....	U
75-69-4	Trichlorofluoromethane	0.8	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

EQUIPMENT BLANK

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: 98-A66328
Date Sampled:: 6/ 9/98
Date Received: 6/10/98
Analysis Date: 6/15/98
Analysis Time: 10:31
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U

000042

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

EQUIPMENT BLANK

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A66328
Date Sampled:: 6/ 9/98
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
91-20-3	Naphthalene	0.4	....	U
103-65-1	n-Propylbenzene	0.4	....	U
100-42-5	Styrene	0.4	....	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	....	U
127-18-4	Tetrachloroethene	1.4	....	U
108-88-3	Toluene	1.1	....	U
87-61-6	1,2,3-Trichlorobenzene	0.3	....	U
120-82-1	1,2,4-Trichlorobenzene	0.4	....	U
71-55-6	1,1,1-Trichloroethane	0.8	....	U
79-00-5	1,1,2-Trichloroethane	1.0	....	U
79-01-6	Trichloroethene	1.0	....	U
96-18-4	1,2,3-Trichloropropane	3.2	....	U
95-63-6	1,2,4-Trimethylbenzene	1.3	....	U
108-67-8	1,3,5-Trimethylbenzene	0.5	....	U
75-01-4	Vinyl chloride	1.1	....	U
75-27-4	Bromodichloromethane	0.8	....	U
95-47-6	o-Xylene	3.0	....	U
108-38-3	m,p-Xylene	4.0	....	U
75-69-4	Trichlorofluoromethane	0.8	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC024MW002

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: 98-A66329
Date Sampled:: 6/ 9/98
Date Received: 6/10/98
Analysis Date: 6/15/98
Analysis Time: 11:08
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U

000046

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC024MW002

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A66329
Date Sampled:: 6/ 9/98
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
91-20-3	Naphthalene	0.4	U
103-65-1	n-Propylbenzene	0.4	U
100-42-5	Styrene	0.4	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	U
127-18-4	Tetrachloroethene	1.4	U
108-88-3	Toluene	1.1	U
87-61-6	1,2,3-Trichlorobenzene	0.3	U
120-82-1	1,2,4-Trichlorobenzene	0.4	U
71-55-6	1,1,1-Trichloroethane	0.8	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	3.2	U
95-63-6	1,2,4-Trimethylbenzene	1.3	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
75-01-4	Vinyl chloride	1.1	U
75-27-4	Bromodichloromethane	0.8	U
95-47-6	o-Xylene	3.0	U
108-38-3	m,p-Xylene	4.0	U
75-69-4	Trichlorofluoromethane	0.8	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L
Dilution Factor: 1
Analysis Method: SW8260B
Delivery Group: 103345
Instrument: HP-8

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/10/98
Analysis Date: 6/14/98
Analysis Time: 17:08
Sample QC Group: 9104

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/10/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U
91-20-3	Naphthalene	0.4	....	U
103-65-1	n-Propylbenzene	0.4	....	U
100-42-5	Styrene	0.4	....	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	....	U
127-18-4	Tetrachloroethene	1.4	....	U
108-88-3	Toluene	1.1	....	U
87-61-6	1,2,3-Trichlorobenzene	0.3	....	U
120-82-1	1,2,4-Trichlorobenzene	0.4	....	U
71-55-6	1,1,1-Trichloroethane	0.8	....	U
79-00-5	1,1,2-Trichloroethane	1.0	....	U
79-01-6	Trichloroethene	1.0	....	U
96-18-4	1,2,3-Trichloropropane	3.2	....	U
95-63-6	1,2,4-Trimethylbenzene	1.3	....	U
108-67-8	1,3,5-Trimethylbenzene	0.5	....	U
75-01-4	Vinyl chloride	1.1	....	U
75-27-4	Bromodichloromethane	0.8	....	U
95-47-6	o-Xylene	1.1	....	U
108-38-3	m,p-Xylene	0.5	....	U
75-69-4	Trichlorofluoromethane	0.8	....	U

1a

MISCELLANEOUS ORGANICS ANALYSIS DATA SHEET

Lab Name : Specialized Assays
Lab Code : SASSAYS Case No : 103345
Matrix (soil/water) : WATER
Sample wt/vol : 5.0 (mL)
%Moisture : 0 %
Injection Volume : 1.0 (mL)

Date Received : 6/10/98
Date Extracted : 6/26/98
Date Analyzed : 6/26/98

LAB SAMPLE	CLIENT ID	COMPOUNDS	CONCENTRATION UNITS ug/mL	Q
66323	TC11	Methane	0.013	U
66328	EQUIPMENT BLANK	Methane	0.013	U
66329	FT024MW002	Methane	0.634	
66330	DUP B	Methane	0.952	
LCS 1	LCS	Methane	1.332	
LCSD 1	LCSD	Methane	1.740	
BLANK	BLANK	Methane	0.130	U

FORM 1a - MISC-1

MISCELLANEOUS CHEMISTRY ANALYSIS SUMMARY

Analysis: Sulfate Analytical Method: _____

Date of Analysis: 6/15/98 - 6/16/98 Date Collected: 6/9/98

Client I.D.	Laboratory I.D.	Result	Units	Blank Result	LCS % Rec	MS % REC	MSD RPD	Duplicate RPD	ICV r2	CCV % REC
FC024mw005	66321	65.0	PPM	<5	102	Diluted	OUT	0.54	0.9994	98
TC11	66323	93.5								
WP022-mw009	66324	80.5								
FC24mw004	66325	78.0								
DUP A	66326	78.0								
FC024mw003	66327	170								
EQUIPMENT BLANK	66328	92 <5								
FC024mw002	66329	93.5								

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615-726-0177 • 1-800-765-0980 • Fax 615-726-3404

Case Narrative
SDG 103819
(8/5/98)

Client: **Parsons Engineering Sciences, Inc.**
1700 Broadway, Suite 900
Denver, Colorado 80290

Client Project Number: 726876.19122

Matrix: Water/Soil

Laboratory Project Number: 103819

Number of Samples: 1 Water
7 Soil

Date Received: 6/12/98

Date Collected: 6/10/98

Sample Receipt

One water sample and seven soil samples were received in good condition at 4° C on 6/12/98. The analysis requested included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and metals. Both purgeable (VPH) and extractable petroleum hydrocarbons (EPH) were requested. All analysis was conducted following Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846). Specific methods used include the following:

SW-846 Method 8260B, VOCs
SW-846 Method 8270C, SVOCs
SW-846 Method 8015B, VPH and EPH
SW-846 Method 6010/7000, metals

Volatile Organic Compounds, Method 8260B

Water

All instrument calibrations, internal standards, and surrogate results associated with the samples were within method or laboratory acceptance criteria. The sample was analyzed as part of analytical batch 5831.

Matrix spike/matrix spike duplicate (MS/MSD) analysis was conducted on a sample from another delivery group. All MS and MSD sample exhibited acceptable recoveries for all spike compounds and all relative percent difference (RPD) values. All compounds were within acceptable limits for the laboratory control standard (LCS).

Soil

All instrument calibrations and surrogate recoveries associated with the samples were within method or laboratory acceptance criteria. The samples were analyzed as part of analytical batch 5226.

MS/MSD analysis was conducted on sample FC2-B1-13.5. All recoveries and RPD values were within method and laboratory established limits. All compound recoveries were within laboratory established limits for the LSC.

General

Sample quantitation was conducted using relative response factors for all compounds with relative standard deviations (RSDs) equal to or less than 15% for all non-calibration check compounds. If the RSD exceeded 15%, calibration curves were used for sample quantitation. Copies of the curves generated for all compounds with RSDs greater than 15% have been supplied.

Semivolatile Organic Compounds, Method 82070C

The soil samples were analyzed as one analytical batch. The batch is 5173. All instrument calibration and surrogate recoveries were within method or laboratory acceptance criteria.

MS/MSD analysis was conducted on sample FC2-B2-15. MS/MSD recoveries were acceptable for all compounds but the RPD value was outside of range for pyrene. All compounds in the laboratory control sample exhibited acceptable recoveries.

As with the VOCs sample quantitation was conducted using response factor for all compounds with less that 15 % RSD. For compounds with greater then 15 % RSD calibration cures were used. Calibration curves have been supplied where appropriate

Purgeable Petroleum Hydrocarbons, Method 8015B

Soil volatile TPH samples were analyzed in analytical batch 5897. All calibration and surrogate results were within method or laboratory acceptance criteria. The MS/MSD and laboratory control standard results exhibited acceptable recoveries for spiked fuels. MS/MSD analysis was conducted on a sample from another delivery group.

Extractable Petroleum Hydrocarbons, Method 8015B

EPH soils were analyzed as analytical batch 220. All calibration and surrogate results were within method or laboratory acceptance criteria. Sample FC2-BB5-17 was used for MS/MSD analysis. The MS/MSD recovery and RPD value was within laboratory acceptance criteria. LCS results exhibited acceptable recoveries for spiked fuels.

Metals, Method 6010/7000

All metal laboratory control, blank, calibration and duplicate results were within laboratory or method required limits. The samples were prepared for ICP metals in preparation batch 5758. Mercury was prepared in batch 5917. The sample duplicate, spike and laboratory control results

present on the CLP like Forms 5-7 are not the historical limits used by the laboratory. Laboratory established limits are supplied on the attached table.

Paula Watts
Technical Services
Specialized Assays, Inc

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

TB-2

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103819
Instrument: HP-8

Lab Sample ID: 98-A68614
Date Sampled:: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/21/98
Analysis Time: 1:10
Sample QC Group: 5831

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	0.5	U
71-43-2	Benzene	0.4	U
108-86-1	Bromobenzene	0.3	U
74-97-5	Bromochloromethane	0.4	U
75-25-2	Bromoform	1.2	U
74-83-9	Bromomethane	1.1	U
104-51-8	n-Butylbenzene	1.1	U
135-98-8	sec-Butylbenzene	1.3	U
98-06-6	t-Butylbenzene	1.4	U
56-23-5	Carbon tetrachloride	2.1	U
108-90-7	Chlorobenzene	0.4	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	0.3	U
74-87-3	Chloromethane	1.3	U
95-49-8	2-Chlorotoluene	0.4	U
106-43-4	4-Chlorotoluene	0.6	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	U
124-48-1	Dibromochloromethane	0.5	U
74-95-3	1,2-Dibromoethane	0.6	U
74-95-3	Dibromomethane	2.4	U
95-50-1	1,2-Dichlorobenzene	0.3	U
541-73-1	1,3-Dichlorobenzene	1.2	U
106-46-7	1,4-Dichlorobenzene	0.3	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	0.4	U
107-06-2	1,2-Dichloroethane	0.6	U
75-35-4	1,1-Dichloroethene	1.2	U
156-59-2	cis-1,2-Dichloroethene	1.2	U
156-60-5	trans-1,2-Dichloroethene	0.6	U
78-87-5	1,2-Dichloropropane	0.4	U
142-28-9	1,3-Dichloropropane	0.4	U
594-20-7	2,2-Dichloropropane	3.5	U
563-58-6	1,1-Dichloropropene	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	0.6	U
87-68-3	Hexachlorobutadiene	1.1	U
98-82-8	Isopropylbenzene	0.5	U
99-87-6	4-Isopropyltoluene	1.2	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

TB-2

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A68614
Date Sampled:: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	0.3	U
91-20-3	Naphthalene	0.4	U
103-65-1	n-Propylbenzene	0.4	U
100-42-5	Styrene	0.4	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	U
127-18-4	Tetrachloroethene	1.4	U
108-88-3	Toluene	1.1	U
87-61-6	1,2,3-Trichlorobenzene	0.3	U
120-82-1	1,2,4-Trichlorobenzene	0.4	U
71-55-6	1,1,1-Trichloroethane	0.8	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	3.2	U
95-63-6	1,2,4-Trimethylbenzene	1.3	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
75-01-4	Vinyl chloride	1.1	U
75-27-4	Bromodichloromethane	0.8	U
95-47-6	o-Xylene	1.1	U
108-38-3	m,p-Xylene	0.5	U
75-69-4	Trichlorofluoromethane	0.8	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L
Dilution Factor: 1
Analysis Method: SW8260B
Delivery Group: 103819
Instrument: HP-8

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/12/98
Analysis Date: 6/20/98
Analysis Time: 16:34
Sample QC Group: 6839

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U
91-20-3	Naphthalene	0.4	....	U
103-65-1	n-Propylbenzene	0.4	....	U
100-42-5	Styrene	0.4	....	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	....	U
127-18-4	Tetrachloroethene	1.4	....	U
108-88-3	Toluene	1.1	....	U
87-61-6	1,2,3-Trichlorobenzene	0.3	....	U
120-82-1	1,2,4-Trichlorobenzene	0.4	....	U
71-55-6	1,1,1-Trichloroethane	0.8	....	U
79-00-5	1,1,2-Trichloroethane	1.0	....	U
79-01-6	Trichloroethene	1.0	....	U
96-18-4	1,2,3-Trichloropropane	3.2	....	U
95-63-6	1,2,4-Trimethylbenzene	1.3	....	U
108-67-8	1,3,5-Trimethylbenzene	0.5	....	U
75-01-4	Vinyl chloride	1.1	....	U
75-27-4	Bromodichloromethane	0.8	....	U
95-47-6	o-Xylene	1.1	....	U
108-38-3	m,p-Xylene	0.5	....	U
75-69-4	Trichlorofluoromethane	0.8	....	U

SPECIALIZED ASSAYS, INC.

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Phone 1-615-726-0177

Sample Identification

FC2-B1-13.5

Matrix: Soil
% Dry Weight: 76.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103819
Instrument: HP-1

Lab Sample ID: 98-A68615
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/18/98
Analysis Time: 7:24
Sample QC Group: 5226

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	3.9	....	U
71-43-2	Benzene	2.6	....	U
108-86-1	Bromobenzene	2.6	....	U
124-48-1	Bromochloromethane	2.6	....	U
75-25-2	Bromoform	7.9	....	U
74-83-9	Bromomethane	6.6	....	U
104-51-8	n-Butylbenzene	6.6	....	U
135-98-8	sec-Butylbenzene	9.2	....	U
98-06-6	t-Butylbenzene	9.2	....	U
56-23-5	Carbon tetrachloride	13.2	....	U
108-90-7	Chlorobenzene	2.6	....	U
75-00-3	Chloroethane	6.6	....	U
67-66-3	Chloroform	2.6	....	U
74-87-3	Chloromethane	9.2	....	U
95-49-8	2-Chlorotoluene	2.6	....	U
106-43-4	4-Chlorotoluene	3.9	....	U
96-12-8	1,2-Dibromo-3-chloropropane	1.3	....	U
124-48-1	Dibromochloromethane	3.9	....	U
74-95-3	1,2-Dibromoethane	3.9	....	U
74-95-3	Dibromomethane	13.2	....	U
95-50-1	1,2-Dichlorobenzene	2.6	....	U
541-73-1	1,3-Dichlorobenzene	7.9	....	U
106-46-7	1,4-Dichlorobenzene	2.6	....	U
75-71-8	Dichlorodifluoromethane	6.6	....	U
75-34-3	1,1-Dichloroethane	2.6	....	U
107-06-2	1,2-Dichloroethane	3.9	....	U
75-35-4	1,1-Dichloroethene	7.9	....	U
156-59-2	cis-1,2-Dichloroethene	7.9	....	U
156-60-5	trans-1,2-Dichloroethene	3.9	....	U
78-87-5	1,2-Dichloropropane	2.6	....	U
142-28-9	1,3-Dichloropropane	2.6	....	U
594-20-7	2,2-Dichloropropane	26.3	....	U
563-58-6	1,1-Dichloropropene	6.6	....	U
10061-01-5	cis-1,3-Dichloropropene	6.6	....	U
10061-02-6	trans-1,3-Dichloropropene	6.6	....	U
100-41-4	Ethylbenzene	3.9	....	U
87-68-3	Hexachlorobutadiene	6.6	....	U
98-82-8	Isopropylbenzene	10.5	....	U
99-87-6	4-Isopropyltoluene	7.9	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification-

FC2-B1-13.5

Matrix: Soil
% Dry Weight: 76.
Units: ug/kg dry weight

Lab Sample ID: 98-A68615
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	2.6	U
91-20-3	Naphthalene	2.6	U
103-65-1	n-Propylbenzene	2.6	U
100-42-5	Styrene	2.6	U
630-20-6	1,1,1,2-Tetrachloroethane	3.9	U
79-34-5	1,1,2,2-Tetrachlorpethane	2.6	U
127-18-4	Tetrachloroethene	9.2	U
108-88-3	Toluene	6.6	U
87-61-6	1,2,3-Trichlorobenzene	2.6	U
120-82-1	1,2,4-Trichlorobenzene	2.6	U
71-55-6	1,1,1-Trichloroethane	5.3	U
79-00-5	1,1,2-Trichloroethane	6.6	U
79-01-6	Trichloroethene	13.2	U
96-18-4	1,2,3-Trichloropropane	26.3	U
95-63-6	1,2,4-Trimethylbenzene	9.2	U
108-67-8	1,3,5-Trimethylbenzene	3.9	U
75-01-4	Vinyl chloride	11.8	U
75-27-4	Bromodichloromethane	5.3	U
6615	o-Xylene	6.6	U
6616	m,p-Xylene	3.9	U
75-69-4	Trichlorofluoromethane	5.3	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B3-17.5

Matrix: Soil
% Dry Weight: 78.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103819
Instrument: HP-1

Lab Sample ID: 98-A68616
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/18/98
Analysis Time: 20:00
Sample QC Group: 5226

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	3.8	....	U
71-43-2	Benzene	2.6	....	U
108-86-1	Bromobenzene	2.6	....	U
124-48-1	Bromochloromethane	2.6	....	U
75-25-2	Bromoform	7.7	....	U
74-83-9	Bromomethane	6.4	....	U
104-51-8	n-Butylbenzene	6.4	....	U
135-98-8	sec-Butylbenzene	9.0	....	U
98-06-6	t-Butylbenzene	9.0	....	U
56-23-5	Carbon tetrachloride	12.8	....	U
108-90-7	Chlorobenzene	2.6	....	U
75-00-3	Chloroethane	6.4	....	U
67-66-3	Chloroform	2.6	....	U
74-87-3	Chloromethane	9.0	....	U
95-49-8	2-Chlorotoluene	2.6	....	U
106-43-4	4-Chlorotoluene	3.8	....	U
96-12-8	1,2-Dibromo-3-chloropropane	1.3	....	U
124-48-1	Dibromochloromethane	3.8	....	U
74-95-3	1,2-Dibromoethane	3.8	....	U
74-95-3	Dibromomethane	12.8	....	U
95-50-1	1,2-Dichlorobenzene	2.6	....	U
541-73-1	1,3-Dichlorobenzene	7.7	....	U
106-46-7	1,4-Dichlorobenzene	2.6	....	U
75-71-8	Dichlorodifluoromethane	6.4	....	U
75-34-3	1,1-Dichloroethane	2.6	....	U
107-06-2	1,2-Dichloroethane	3.8	....	U
75-35-4	1,1-Dichloroethene	7.7	....	U
156-59-2	cis-1,2-Dichloroethene	7.7	....	U
156-60-5	trans-1,2-Dichloroethene	3.8	....	U
78-87-5	1,2-Dichloropropane	2.6	....	U
142-28-9	1,3-Dichloropropane	2.6	....	U
594-20-7	2,2-Dichloropropane	25.6	....	U
563-58-6	1,1-Dichloropropene	6.4	....	U
10061-01-5	cis-1,3-Dichloropropene	6.4	....	U
10061-02-6	trans-1,3-Dichloropropene	6.4	....	U
100-41-4	Ethylbenzene	3.8	....	U
87-68-3	Hexachlorobutadiene	6.4	....	U
98-82-8	Isopropylbenzene	10.3	....	U
99-87-6	4-Isopropyltoluene	7.7	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification-

FC2-B3-17.5

Matrix: Soil
% Dry Weight: 78.
Units: ug/kg dry weight

Lab Sample ID: 98-A68616
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
75-09-2	Methylene chloride	2.6	....	U
91-20-3	Naphthalene	2.6	....	U
103-65-1	n-Propylbenzene	2.6	....	U
100-42-5	Styrene	2.6	....	U
630-20-6	1,1,1,2-Tetrachloroethane	3.8	....	U
79-34-5	1,1,2,2-Tetrachloroethane	2.6	....	U
127-18-4	Tetrachloroethene	9.0	....	U
108-88-3	Toluene	6.4	....	U
87-61-6	1,2,3-Trichlorobenzene	2.6	....	U
120-82-1	1,2,4-Trichlorobenzene	2.6	....	U
71-55-6	1,1,1-Trichloroethane	5.1	....	U
79-00-5	1,1,2-Trichloroethane	6.4	....	U
79-01-6	Trichloroethene	12.8	....	U
96-18-4	1,2,3-Trichloropropane	25.6	....	U
95-63-6	1,2,4-Trimethylbenzene	9.0	....	U
108-67-8	1,3,5-Trimethylbenzene	3.8	....	U
75-01-4	Vinyl chloride	11.5	....	U
75-27-4	Bromodichloromethane	5.1	....	U
6615	o-Xylene	6.4	....	U
6616	m,p-Xylene	3.8	....	U
75-69-4	Trichlorofluoromethane	5.1	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B4-17.5

Matrix: Soil
% Dry Weight: 91.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8260B
Delivery Group: 103819
Instrument: HP-1

Lab Sample ID: 98-A68617
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/18/98
Analysis Time: 20:35
Sample QC Group: 6844

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	16.5	U
71-43-2	Benzene	11.0	U
108-86-1	Bromobenzene	11.0	U
124-48-1	Bromochloromethane	11.0	U
75-25-2	Bromoform	33.0	U
74-83-9	Bromomethane	27.5	U
104-51-8	n-Butylbenzene	27.5	U
135-98-8	sec-Butylbenzene	65.9	
98-06-6	t-Butylbenzene	38.5	U
56-23-5	Carbon tetrachloride	54.9	U
108-90-7	Chlorobenzene	11.0	U
75-00-3	Chloroethane	27.5	U
67-66-3	Chloroform	11.0	U
74-87-3	Chloromethane	38.5	U
95-49-8	2-Chlorotoluene	11.0	U
106-43-4	4-Chlorotoluene	16.5	U
96-12-8	1,2-Dibromo-3-chloropropane	5.5	U
124-48-1	Dibromochloromethane	16.5	U
74-95-3	1,2-Dibromoethane	16.5	U
74-95-3	Dibromomethane	54.9	U
95-50-1	1,2-Dichlorobenzene	11.0	U
541-73-1	1,3-Dichlorobenzene	33.0	U
106-46-7	1,4-Dichlorobenzene	11.0	U
75-71-8	Dichlorodifluoromethane	27.5	U
75-34-3	1,1-Dichloroethane	11.0	U
107-06-2	1,2-Dichloroethane	16.5	U
75-35-4	1,1-Dichloroethene	33.0	U
156-59-2	cis-1,2-Dichloroethene	33.0	U
156-60-5	trans-1,2-Dichloroethene	16.5	U
78-87-5	1,2-Dichloropropane	11.0	U
142-28-9	1,3-Dichloropropane	11.0	U
594-20-7	2,2-Dichloropropane	110.	U
563-58-6	1,1-Dichloropropene	27.5	U
10061-01-5	cis-1,3-Dichloropropene	27.5	U
10061-02-6	trans-1,3-Dichloropropene	27.5	U
100-41-4	Ethylbenzene	16.5	U
87-68-3	Hexachlorobutadiene	27.5	U
98-82-8	Isopropylbenzene	44.0	U
99-87-6	4-Isopropyltoluene	87.9	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification.

FC2-B4-17.5

Matrix: Soil
% Dry Weight: 91.
Units: ug/kg dry weight

Lab Sample ID: 98-A68617
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
75-09-2	Methylene chloride	11.0	....	U
91-20-3	Naphthalene	165.	....	
103-65-1	n-Propylbenzene	33.0	....	
100-42-5	Styrene	11.0	....	U
630-20-6	1,1,1,2-Tetrachloroethane	16.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	11.0	....	U
127-18-4	Tetrachloroethene	38.5	....	U
108-88-3	Toluene	27.5	....	U
87-61-6	1,2,3-Trichlorobenzene	11.0	....	U
120-82-1	1,2,4-Trichlorobenzene	11.0	....	U
71-55-6	1,1,1-Trichloroethane	22.0	....	U
79-00-5	1,1,2-Trichloroethane	27.5	....	U
79-01-6	Trichloroethene	54.9	....	U
96-18-4	1,2,3-Trichloropropane	110.	....	U
95-63-6	1,2,4-Trimethylbenzene	214.	....	
108-67-8	1,3,5-Trimethylbenzene	98.9	....	
75-01-4	Vinyl chloride	49.5	....	U
75-27-4	Bromodichloromethane	22.0	....	U
6615	o-Xylene	27.5	....	U
6616	m,p-Xylene	16.5	....	U
75-69-4	Trichlorofluoromethane	22.0	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification-

FC2-B2-15

Matrix: Soil
% Dry Weight: 60.
Units: ug/kg dry weight
Dilution Factor: 125.
Analysis Method: SW8260B
Delivery Group: 103819
Instrument: HP-1

Lab Sample ID: 98-A68618
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/18/98
Analysis Time: 21:11
Sample QC Group: 6844

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	625.	U
71-43-2	Benzene	417.	U
108-86-1	Bromobenzene	417.	U
124-48-1	Bromochloromethane	417.	U
75-25-2	Bromoform	1250	U
74-83-9	Bromomethane	1040	U
104-51-8	n-Butylbenzene	1040	U
135-98-8	sec-Butylbenzene	24200	
98-06-6	t-Butylbenzene	3120	
56-23-5	Carbon tetrachloride	2080	U
108-90-7	Chlorobenzene	26900	
75-00-3	Chloroethane	1040	U
67-66-3	Chloroform	417.	U
74-87-3	Chloromethane	1460	U
95-49-8	2-Chlorotoluene	417.	U
106-43-4	4-Chlorotoluene	625.	U
96-12-8	1,2-Dibromo-3-chloropropane	208.	U
124-48-1	Dibromochloromethane	625.	U
74-95-3	1,2-Dibromoethane	625.	U
74-95-3	Dibromomethane	2080	U
95-50-1	1,2-Dichlorobenzene	417.	U
541-73-1	1,3-Dichlorobenzene	1250	U
106-46-7	1,4-Dichlorobenzene	417.	U
75-71-8	Dichlorodifluoromethane	1040	U
75-34-3	1,1-Dichloroethane	417.	U
107-06-2	1,2-Dichloroethane	625.	U
75-35-4	1,1-Dichloroethene	1250	U
156-59-2	cis-1,2-Dichloroethene	1250	U
156-60-5	trans-1,2-Dichloroethene	625.	U
78-87-5	1,2-Dichloropropane	417.	U
142-28-9	1,3-Dichloropropane	417.	U
594-20-7	2,2-Dichloropropane	4170	U
563-58-6	1,1-Dichloropropene	1040	U
10061-01-5	cis-1,3-Dichloropropene	1040	U
10061-02-6	trans-1,3-Dichloropropene	1040	U
100-41-4	Ethylbenzene	1880	
87-68-3	Hexachlorobutadiene	1040	U
98-82-8	Isopropylbenzene	1670	U
99-87-6	4-Isopropyltoluene	1040	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B2-15

Matrix: Soil
% Dry Weight: 60.
Units: ug/kg dry weight

Lab Sample ID: 98-A68618
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	417.	U
91-20-3	Naphthalene	7290	
103-65-1	n-Propylbenzene	8960	
100-42-5	Styrene	417.	U
630-20-6	1,1,1,2-Tetrachloroethane	625.	U
79-34-5	1,1,2,2-Tetrachloroethane	417.	U
127-18-4	Tetrachloroethene	1460	U
108-88-3	Toluene	1040	U
87-61-6	1,2,3-Trichlorobenzene	417.	U
120-82-1	1,2,4-Trichlorobenzene	417.	U
71-55-6	1,1,1-Trichloroethane	833.	U
79-00-5	1,1,2-Trichloroethane	1040	U
79-01-6	Trichloroethene	2080	U
96-18-4	1,2,3-Trichloropropane	4170	U
95-63-6	1,2,4-Trimethylbenzene	40800	
108-67-8	1,3,5-Trimethylbenzene	22900	
75-01-4	Vinyl chloride	1880	U
75-27-4	Bromodichloromethane	833.	U
6615	o-Xylene	1040	U
6616	m,p-Xylene	2290	
75-69-4	Trichlorofluoromethane	833.	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification.

FC2-B5-17

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8260B
Delivery Group: 103819
Instrument: HP-1

Lab Sample ID: 98-A68619
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/18/98
Analysis Time: 21:46
Sample QC Group: 6844

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	19.5	....	U
71-43-2	Benzene	13.0	....	U
108-86-1	Bromobenzene	13.0	....	U
124-48-1	Bromochloromethane	13.0	....	U
75-25-2	Bromoform	39.0	....	U
74-83-9	Bromomethane	32.5	....	U
104-51-8	n-Butylbenzene	32.5	....	U
135-98-8	sec-Butylbenzene	45.5	....	U
98-06-6	t-Butylbenzene	292.	....	
56-23-5	Carbon tetrachloride	64.9	....	U
108-90-7	Chlorobenzene	2430	....	
75-00-3	Chloroethane	32.5	....	U
67-66-3	Chloroform	13.0	....	U
74-87-3	Chloromethane	45.5	....	U
95-49-8	2-Chlorotoluene	13.0	....	U
106-43-4	4-Chlorotoluene	19.5	....	U
96-12-8	1,2-Dibromo-3-chloropropane	6.5	....	U
124-48-1	Dibromochloromethane	19.5	....	U
74-95-3	1,2-Dibromoethane	19.5	....	U
74-95-3	Dibromomethane	64.9	....	U
95-50-1	1,2-Dichlorobenzene	13.0	....	U
541-73-1	1,3-Dichlorobenzene	39.0	....	U
106-46-7	1,4-Dichlorobenzene	13.0	....	U
75-71-8	Dichlorodifluoromethane	32.5	....	U
75-34-3	1,1-Dichloroethane	13.0	....	U
107-06-2	1,2-Dichloroethane	19.5	....	U
75-35-4	1,1-Dichloroethene	39.0	....	U
156-59-2	cis-1,2-Dichloroethene	39.0	....	U
156-60-5	trans-1,2-Dichloroethene	19.5	....	U
78-87-5	1,2-Dichloropropane	13.0	....	U
142-28-9	1,3-Dichloropropane	13.0	....	U
594-20-7	2,2-Dichloropropane	130.	....	U
563-58-6	1,1-Dichloropropene	32.5	....	U
10061-01-5	cis-1,3-Dichloropropene	32.5	....	U
10061-02-6	trans-1,3-Dichloropropene	32.5	....	U
100-41-4	Ethylbenzene	182.	....	
87-68-3	Hexachlorobutadiene	32.5	....	U
98-82-8	Isopropylbenzene	51.9	....	U
99-87-6	4-Isopropyltoluene	1750	....	

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B5-17

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight

Lab Sample ID: 98-A68619
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	13.0	U
91-20-3	Naphthalene	156.	
103-65-1	n-Propylbenzene	1080	
100-42-5	Styrene	13.0	U
630-20-6	1,1,1,2-Tetrachloroethane	19.5	U
79-34-5	1,1,2,2-Tetrachloroethane	13.0	U
127-18-4	Tetrachloroethene	45.5	U
108-88-3	Toluene	32.5	U
87-61-6	1,2,3-Trichlorobenzene	13.0	U
120-82-1	1,2,4-Trichlorobenzene	13.0	U
71-55-6	1,1,1-Trichloroethane	26.0	U
79-00-5	1,1,2-Trichloroethane	32.5	U
79-01-6	Trichloroethene	64.9	U
96-18-4	1,2,3-Trichloropropane	130.	U
95-63-6	1,2,4-Trimethylbenzene	4790	
108-67-8	1,3,5-Trimethylbenzene	5430	
75-01-4	Vinyl chloride	58.4	U
75-27-4	Bromodichloromethane	26.0	U
6615	o-Xylene	45.5	
6616	m,p-Xylene	156.	
75-69-4	Trichlorofluoromethane	26.0	U

000189

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B5-17

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 125.
Analysis Method: SW8260B
Delivery Group: 103819
Instrument: HP-1

Lab Sample ID: 98-A68619
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/19/98
Analysis Time: 3:31
Sample QC Group: 6844

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	487.	U
71-43-2	Benzene	325.	U
108-86-1	Bromobenzene	325.	U
124-48-1	Bromochloromethane	325.	U
75-25-2	Bromoform	974.	U
74-83-9	Bromomethane	812.	U
104-51-8	n-Butylbenzene	812.	U
135-98-8	sec-Butylbenzene	1140	U
98-06-6	t-Butylbenzene	1140	U
56-23-5	Carbon tetrachloride	1620	U
108-90-7	Chlorobenzene	4280	
75-00-3	Chloroethane	812.	U
67-66-3	Chloroform	325.	U
74-87-3	Chloromethane	1140	U
95-49-8	2-Chlorotoluene	325.	U
106-43-4	4-Chlorotoluene	487.	U
96-12-8	1,2-Dibromo-3-chloropropane	162.	U
124-48-1	Dibromochloromethane	487.	U
74-95-3	1,2-Dibromoethane	487.	U
74-95-3	Dibromomethane	1620	U
95-50-1	1,2-Dichlorobenzene	325.	U
541-73-1	1,3-Dichlorobenzene	974.	U
106-46-7	1,4-Dichlorobenzene	325.	U
75-71-8	Dichlorodifluoromethane	812.	U
75-34-3	1,1-Dichloroethane	325.	U
107-06-2	1,2-Dichloroethane	487.	U
75-35-4	1,1-Dichloroethene	974.	U
156-59-2	cis-1,2-Dichloroethene	974.	U
156-60-5	trans-1,2-Dichloroethene	487.	U
78-87-5	1,2-Dichloropropane	325.	U
142-28-9	1,3-Dichloropropane	325.	U
594-20-7	2,2-Dichloropropane	3250	U
563-58-6	1,1-Dichloropropene	812.	U
10061-01-5	cis-1,3-Dichloropropene	812.	U
10061-02-6	trans-1,3-Dichloropropene	812.	U
100-41-4	Ethylbenzene	325.	J

000208

COPY 1

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B5-17

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight

Lab Sample ID: 98-A68619
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
87-68-3	Hexachlorobutadiene	812.	U
98-82-8	Isopropylbenzene	1300	U
99-87-6	4-Isopropyltoluene	3080	
75-09-2	Methylene chloride	325.	U
91-20-3	Naphthalene	325.	U
103-65-1	n-Propylbenzene	1300	
100-42-5	Styrene	325.	U
630-20-6	1,1,1,2-Tetrachloroethane	487.	U
79-34-5	1,1,2,2-Tetrachloroethane	325.	U
127-18-4	Tetrachloroethene	1140	U
108-88-3	Toluene	812.	U
87-61-6	1,2,3-Trichlorobenzene	325.	U
120-82-1	1,2,4-Trichlorobenzene	325.	U
71-55-6	1,1,1-Trichloroethane	649.	U
79-00-5	1,1,2-Trichloroethane	812.	U
79-01-6	Trichloroethene	1620	U
96-18-4	1,2,3-Trichloropropane	3250	U
95-63-6	1,2,4-Trimethylbenzene	8440	
108-67-8	1,3,5-Trimethylbenzene	3900	
75-01-4	Vinyl chloride	1460	U
75-27-4	Bromodichloromethane	649.	U
6615	o-Xylene	812.	U
6616	m,p-Xylene	812.	
75-69-4	Trichlorofluoromethane	649.	U

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG
Dilution Factor: 1
Analysis Method: SW8260B
Delivery Group: 103819
Instrument: HP-1

Lab Sample ID: BLANK
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/18/98
Analysis Time: 18:48
Sample QC Group: ~~6844~~ 5831

FORM I

CAS NUMBER	~~ANALYTE~~	CONCENTRATION		FLAG
71-43-2	Benzene	2.0	....	U
144-10-5	1-Chlorohexane	3.0	....	U
108-86-1	Bromobenzene	2.0	....	U
124-48-1	Bromochloromethane	2.0	....	U
75-25-2	Bromoform	6.0	....	U
74-83-9	Bromomethane	5.0	....	U
104-51-8	n-Butylbenzene	5.0	....	U
135-98-8	sec-Butylbenzene	7.0	....	U
98-06-6	t-Butylbenzene	7.0	....	U
56-23-5	Carbon tetrachloride	10.0	....	U
108-90-7	Chlorobenzene	2.0	....	U
75-00-3	Chloroethane	5.0	....	U
67-66-3	Chloroform	2.0	....	U
74-87-3	Chloromethane	7.0	....	U
95-49-8	2-Chlorotoluene	2.0	....	U
106-43-4	4-Chlorotoluene	3.0	....	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	....	U
124-48-1	Dibromochloromethane	3.0	....	U
74-95-3	1,2-Dibromoethane	3.0	....	U
74-95-3	Dibromomethane	10.0	....	U
95-50-1	1,2-Dichlorobenzene	2.0	....	U
541-73-1	1,3-Dichlorobenzene	6.0	....	U
106-46-7	1,4-Dichlorobenzene	2.0	....	U
75-71-8	Dichlorodifluoromethane	5.0	....	U
75-34-3	1,1-Dichloroethane	2.0	....	U
107-06-2	1,2-Dichloroethane	3.0	....	U
75-35-4	1,1-Dichloroethene	6.0	....	U
156-59-2	cis-1,2-Dichloroethene	6.0	....	U
156-60-5	trans-1,2-Dichloroethene	3.0	....	U
78-87-5	1,2-Dichloropropane	2.0	....	U
142-28-9	1,3-Dichloropropane	2.0	....	U
594-20-7	2,2-Dichloropropane	20.0	....	U
563-58-6	1,1-Dichloropropene	5.0	....	U
10061-01-5	cis-1,3-Dichloropropene	5.0	....	U
10061-02-6	trans-1,3-Dichloropropene	5.0	....	U
100-41-4	Ethylbenzene	3.0	....	U

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG

Lab Sample ID: BLANK
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
87-68-3	Hexachlorobutadiene	5.0	....	U
98-82-8	Isopropylbenzene	8.0	....	U
99-87-6	4-Isopropyltoluene	6.0	....	U
75-09-2	Methylene chloride	14.0	....	
91-20-3	Naphthalene	2.0	....	U
103-65-1	n-Propylbenzene	2.0	....	U
100-42-5	Styrene	2.0	....	U
630-20-6	1,1,1,2-Tetrachloroethane	3.0	....	U
79-34-5	1,1,2,2-Tetrachloroethane	2.0	....	U
127-18-4	Tetrachloroethene	7.0	....	U
108-88-3	Toluene	5.0	....	U
87-61-6	1,2,3-Trichlorobenzene	2.0	....	U
120-82-1	1,2,4-Trichlorobenzene	2.0	....	U
71-55-6	1,1,1-Trichloroethane	4.0	....	U
79-00-5	1,1,2-Trichloroethane	5.0	....	U
79-01-6	Trichloroethene	10.0	....	U
96-18-4	1,2,3-Trichloropropane	20.0	....	U
95-63-6	1,2,4-Trimethylbenzene	7.0	....	U
108-67-8	1,3,5-Trimethylbenzene	3.0	....	U
75-01-4	Vinyl chloride	9.0	....	U
75-27-4	Bromodichloromethane	4.0	....	U
6615	o-Xylene	5.0	....	U
6616	m,p-Xylene	3.0	....	U
75-69-4	Trichlorofluoromethane	4.0	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B1-13.5

Matrix: Soil
% Dry Weight: 76.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103819
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A68615
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 9:41
Sample QC Group: 5173

Extraction Date: 6/22/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	921	U
208-96-8	Acenaphthylene	921	U
120-12-7	Anthracene	921	U
65-85-0	Benzoic Acid	2110	U
56-55-3	Benzo(a)anthracene	921	U
50-32-8	Benzo(a)pyrene	921	U
205-99-2	Benzo(b)fluoranthene	921	U
191-24-2	Benzo(g,h,i)perylene	921	U
101-55-3	4-Bromophenylphenylether	921	U
85-68-7	Butylbenzylphthalate	921	U
59-50-7	4-Chloro-3-methylphenol	1710	U
106-47-8	4-Chloroaniline	1710	U
111-91-1	bis(2-Chloroethoxy)methane	921	U
111-44-4	bis(2-Chloroethyl)ether	921	U
108-60-1	bis(2-Chloroisopropyl)ether	921	U
91-58-7	2-Chloronaphthalene	921	U
95-57-8	2-Chlorophenol	921	U
7005-72-3	4-Chlorophenylphenylether	921	U
218-01-9	Chrysene	921	U
132-64-9	Dibenzofuran	921	U
53-70-3	Dibenz(a,h)anthracene	921	U
95-50-1	1,2-Dichlorobenzene	921	U
541-73-1	1,3-Dichlorobenzene	921	U
106-46-7	1,4-Dichlorobenzene	921	U
91-94-1	3,3'-Dichlorobenzidine	1710	U
120-83-2	2,4-Dichlorophenol	395	U
84-66-2	Diethylphthalate	921	U
105-67-9	2,4-Dimethylphenol	395	U
131-11-3	Dimethylphthalate	921	U
84-74-2	Di-n-butylphthalate	921	U
534-52-1	4,6-Dinitro-2-methylphenol	4340	U
51-28-5	2,4-Dinitrophenol	4340	U
121-14-2	2,4-dinitrotoluene	921	U
606-20-2	2,6-Dinitrotoluene	921	U
117-84-0	Di-n-octylphthalate	921	U
206-44-0	Fluoranthene	921	U
86-73-7	Fluorene	921	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B1-13.5

Matrix: Soil
% Dry Weight: 76.
Units: ug/kg dry weight

Lab Sample ID: 98-A68615
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	921	U
87-68-3	Hexachlorobutadiene	921	U
77-47-4	Hexachlorocyclopentadiene	921	U
67-72-1	Hexachloroethane	921	U
193-39-5	Indeno(1,2,3-cd)pyrene	921	U
78-59-1	Isophorone	921	U
91-57-6	2-Methylnaphthalene	921	U
95-48-7	2-Methylphenol	395	U
106-44-5	m,p-Methylphenol	395	U
91-20-3	Naphthalene	921	U
88-74-4	2-Nitroaniline	4340	U
99-09-2	3-Nitroaniline	4340	U
100-01-6	4-Nitroaniline	4340	U
98-95-3	Nitrobenzene	921	U
88-75-5	2-Nitrophenol	395	U
100-02-7	4-Nitrophenol	2110	U
621-64-7	N-nitrosodi-n-propylamine	921	U
86-30-6	N-nitrosodiphenylamine	921	U
87-86-5	Pentachlorophenol	4340	U
85-01-8	Phenanthrene	921	U
108-95-2	Phenol	395	U
129-00-0	Pyrene	921	U
117-81-7	Bis(2-ethylhexyl)phthalate	921	U
120-82-1	1,2,4-Trichlorobenzene	921	U
95-95-4	2,4,5-Trichlorophenol	4340	U
88-06-2	2,4,6-Trichlorophenol	395	U
NA	Benzyl Alcohol	1710	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B3-17.5

Matrix: Soil
% Dry Weight: 78.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103819
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A68616
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 10:18
Sample QC Group: 5173

Extraction Date: 6/22/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	897	U
208-96-8	Acenaphthylene	897	U
120-12-7	Anthracene	897	U
65-85-0	Benzoic Acid	2050	U
56-55-3	Benzo(a)anthracene	897	U
50-32-8	Benzo(a)pyrene	897	U
205-99-2	Benzo(b)fluoranthene	897	U
191-24-2	Benzo(g,h,i)perylene	897	U
101-55-3	4-Bromophenylphenylether	897	U
85-68-7	Butylbenzylphthalate	897	U
59-50-7	4-Chloro-3-methylphenol	1670	U
106-47-8	4-Chloroaniline	1670	U
111-91-1	bis(2-Chloroethoxy)methane	897	U
111-44-4	bis(2-Chloroethyl)ether	897	U
108-60-1	bis(2-Chloroisopropyl)ether	897	U
91-58-7	2-Chloronaphthalene	897	U
95-57-8	2-Chlorophenol	897	U
7005-72-3	4-Chlorophenylphenylether	897	U
218-01-9	Chrysene	897	U
132-64-9	Dibenzofuran	897	U
53-70-3	Dibenz(a,h)anthracene	897	U
95-50-1	1,2-Dichlorobenzene	897	U
541-73-1	1,3-Dichlorobenzene	897	U
106-46-7	1,4-Dichlorobenzene	897	U
91-94-1	3,3'-Dichlorobenzidine	1670	U
120-83-2	2,4-Dichlorophenol	385	U
84-66-2	Diethylphthalate	897	U
105-67-9	2,4-Dimethylphenol	385	U
131-11-3	Dimethylphthalate	897	U
84-74-2	Di-n-butylphthalate	897	U
534-52-1	4,6-Dinitro-2-methylphenol	4230	U
51-28-5	2,4-Dinitrophenol	4230	U
121-14-2	2,4-dinitrotoluene	897	U
606-20-2	2,6-Dinitrotoluene	897	U
117-84-0	Di-n-octylphthalate	897	U
206-44-0	Fluoranthene	897	U
86-73-7	Fluorene	897	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B3-17.5

Matrix: Soil
% Dry Weight: 78.
Units: ug/kg dry weight

Lab Sample ID: 98-A68616
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	897	U
87-68-3	Hexachlorobutadiene	897	U
77-47-4	Hexachlorocyclopentadiene	897	U
67-72-1	Hexachloroethane	897	U
193-39-5	Indeno(1,2,3-cd)pyrene	897	U
78-59-1	Isophorone	897	U
91-57-6	2-Methylnaphthalene	897	U
95-48-7	2-Methylphenol	385	U
106-44-5	m,p-Methylphenol	385	U
91-20-3	Naphthalene	897	U
88-74-4	2-Nitroaniline	4230	U
99-09-2	3-Nitroaniline	4230	U
100-01-6	4-Nitroaniline	4230	U
98-95-3	Nitrobenzene	897	U
88-75-5	2-Nitrophenol	385	U
100-02-7	4-Nitrophenol	2050	U
621-64-7	N-nitrosodi-n-propylamine	897	U
86-30-6	N-nitrosodiphenylamine	897	U
87-86-5	Pentachlorophenol	4230	U
85-01-8	Phenanthrene	897	U
108-95-2	Phenol	385	U
129-00-0	Pyrene	897	U
117-81-7	Bis(2-ethylhexyl)phthalate	897	U
120-82-1	1,2,4-Trichlorobenzene	897	U
95-95-4	2,4,5-Trichlorophenol	4230	U
88-06-2	2,4,6-Trichlorophenol	385	U
NA	Benzyl Alcohol	1670	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B4-17.5

Matrix: Soil
% Dry Weight: 91.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103819
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A68617
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 10:55
Sample QC Group: 5173

Extraction Date: 6/22/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	769	U
208-96-8	Acenaphthylene	769	U
120-12-7	Anthracene	769	U
65-85-0	Benzoic Acid	1760	U
56-55-3	Benzo(a)anthracene	769	U
50-32-8	Benzo(a)pyrene	769	U
205-99-2	Benzo(b)fluoranthene	769	U
191-24-2	Benzo(g,h,i)perylene	769	U
101-55-3	4-Bromophenylphenylether	769	U
85-68-7	Butylbenzylphthalate	769	U
59-50-7	4-Chloro-3-methylphenol	1430	U
106-47-8	4-Chloroaniline	1430	U
111-91-1	bis(2-Chloroethoxy)methane	769	U
111-44-4	bis(2-Chloroethyl)ether	769	U
108-60-1	bis(2-Chloroisopropyl)ether	769	U
91-58-7	2-Chloronaphthalene	769	U
95-57-8	2-Chlorophenol	769	U
7005-72-3	4-Chlorophenylphenylether	769	U
218-01-9	Chrysene	769	U
132-64-9	Dibenzofuran	769	U
53-70-3	Dibenz(a,h)anthracene	769	U
95-50-1	1,2-Dichlorobenzene	769	U
541-73-1	1,3-Dichlorobenzene	769	U
106-46-7	1,4-Dichlorobenzene	769	U
91-94-1	3,3'-Dichlorobenzidine	1430	U
120-83-2	2,4-Dichlorophenol	330	U
84-66-2	Diethylphthalate	769	U
105-67-9	2,4-Dimethylphenol	330	U
131-11-3	Dimethylphthalate	769	U
84-74-2	Di-n-butylphthalate	769	U
534-52-1	4,6-Dinitro-2-methylphenol	3630	U
51-28-5	2,4-Dinitrophenol	3630	U
121-14-2	2,4-dinitrotoluene	769	U
606-20-2	2,6-Dinitrotoluene	769	U
117-84-0	Di-n-octylphthalate	769	U
206-44-0	Fluoranthene	769	U
86-73-7	Fluorene	769	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B4-17.5

Matrix: Soil
% Dry Weight: 91.
Units: ug/kg dry weight

Lab Sample ID: 98-A68617
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	769	U
87-68-3	Hexachlorobutadiene	769	U
77-47-4	Hexachlorocyclopentadiene	769	U
67-72-1	Hexachloroethane	769	U
193-39-5	Indeno(1,2,3-cd)pyrene	769	U
78-59-1	Isophorone	769	U
91-57-6	2-Methylnaphthalene	769	U
95-48-7	2-Methylphenol	330	U
106-44-5	m,p-Methylphenol	330	U
91-20-3	Naphthalene	769	U
88-74-4	2-Nitroaniline	3630	U
99-09-2	3-Nitroaniline	3630	U
100-01-6	4-Nitroaniline	3630	U
98-95-3	Nitrobenzene	769	U
88-75-5	2-Nitrophenol	330	U
100-02-7	4-Nitrophenol	1760	U
621-64-7	N-nitrosodi-n-propylamine	769	U
86-30-6	N-nitrosodiphenylamine	769	U
87-86-5	Pentachlorophenol	3630	U
85-01-8	Phenanthrene	769	U
108-95-2	Phenol	330	U
129-00-0	Pyrene	769	U
117-81-7	Bis(2-ethylhexyl)phthalate	769	U
120-82-1	1,2,4-Trichlorobenzene	769	U
95-95-4	2,4,5-Trichlorophenol	3630	U
88-06-2	2,4,6-Trichlorophenol	330	U
NA	Benzyl Alcohol	1430	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B2-15

Matrix: Soil
% Dry Weight: 60.
Units: ug/kg dry weight
Dilution Factor: 10.
Analysis Method: SW8270C
Delivery Group: 103819
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 2.0 ml

Lab Sample ID: 98-A68618
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/26/98
Analysis Time: 11:39
Sample QC Group: 5173

Extraction Date: 6/22/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	23300.	U
208-96-8	Acenaphthylene	23300.	U
120-12-7	Anthracene	23300.	U
65-85-0	Benzoic Acid	53300.	U
56-55-3	Benzo(a)anthracene	23300.	U
50-32-8	Benzo(a)pyrene	23300.	U
205-99-2	Benzo(b)fluoranthene	23300.	U
191-24-2	Benzo(g,h,i)perylene	23300.	U
101-55-3	4-Bromophenylphenylether	23300.	U
85-68-7	Butylbenzylphthalate	23300.	U
59-50-7	4-Chloro-3-methylphenol	43300.	U
106-47-8	4-Chloroaniline	43300.	U
111-91-1	bis(2-Chloroethoxy)methane	23300.	U
111-44-4	bis(2-Chloroethyl)ether	23300.	U
108-60-1	bis(2-Chloroisopropyl)ether	23300.	U
91-58-7	2-Chloronaphthalene	23300.	U
95-57-8	2-Chlorophenol	23300.	U
7005-72-3	4-Chlorophenylphenylether	23300.	U
218-01-9	Chrysene	23300.	U
132-64-9	Dibenzofuran	23300.	U
53-70-3	Dibenz(a,h)anthracene	23300.	U
95-50-1	1,2-Dichlorobenzene	23300.	U
541-73-1	1,3-Dichlorobenzene	23300.	U
106-46-7	1,4-Dichlorobenzene	23300.	U
91-94-1	3,3'-Dichlorobenzidine	43300.	U
120-83-2	2,4-Dichlorophenol	10000.	U
84-66-2	Diethylphthalate	23300.	U
105-67-9	2,4-Dimethylphenol	10000.	U
131-11-3	Dimethylphthalate	23300.	U
84-74-2	Di-n-butylphthalate	23300.	U
534-52-1	4,6-Dinitro-2-methylphenol	11000.	U
51-28-5	2,4-Dinitrophenol	11000.	U
121-14-2	2,4-dinitrotoluene	23300.	U
606-20-2	2,6-Dinitrotoluene	23300.	U
117-84-0	Di-n-octylphthalate	23300.	U
206-44-0	Fluoranthene	23300.	U
86-73-7	Fluorene	23300.	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B2-15

Matrix: Soil
% Dry Weight: 60.
Units: ug/kg dry weight

Lab Sample ID: 98-A68618
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	23300.	U
87-68-3	Hexachlorobutadiene	23300.	U
77-47-4	Hexachlorocyclopentadiene	23300.	U
67-72-1	Hexachloroethane	23300.	U
193-39-5	Indeno(1,2,3-cd)pyrene	23300.	U
78-59-1	Isophorone	23300.	U
91-57-6	2-Methylnaphthalene	24500.	
95-48-7	2-Methylphenol	10000.	U
106-44-5	m,p-Methylphenol	10000.	U
91-20-3	Naphthalene	8880	
88-74-4	2-Nitroaniline	11000.	U
99-09-2	3-Nitroaniline	11000.	U
100-01-6	4-Nitroaniline	11000.	U
98-95-3	Nitrobenzene	23300.	U
88-75-5	2-Nitrophenol	10000.	U
100-02-7	4-Nitrophenol	53300.	U
621-64-7	N-nitrosodi-n-propylamine	23300.	U
86-30-6	N-nitrosodiphenylamine	23300.	U
87-86-5	Pentachlorophenol	11000.	U
85-01-8	Phenanthrene	23300.	U
108-95-2	Phenol	10000.	U
129-00-0	Pyrene	23300.	U
117-81-7	Bis(2-ethylhexyl)phthalate	8880	
120-82-1	1,2,4-Trichlorobenzene	23300.	U
95-95-4	2,4,5-Trichlorophenol	11000.	U
88-06-2	2,4,6-Trichlorophenol	10000.	U
NA	Benzyl Alcohol	2170	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B5-17

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103819
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A66619
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/23/98
Analysis Time: 23:20
Sample QC Group: 5173

Extraction Date: 6/22/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	909	U
208-96-8	Acenaphthylene	909	U
120-12-7	Anthracene	909	U
65-85-0	Benzoic Acid	2080	U
56-55-3	Benzo(a)anthracene	909	U
50-32-8	Benzo(a)pyrene	909	U
205-99-2	Benzo(b)fluoranthene	909	U
191-24-2	Benzo(g,h,i)perylene	909	U
101-55-3	4-Bromophenylphenylether	909	U
85-68-7	Butylbenzylphthalate	909	U
59-50-7	4-Chloro-3-methylphenol	1690	U
106-47-8	4-Chloroaniline	1690	U
111-91-1	bis(2-Chloroethoxy)methane	909	U
111-44-4	bis(2-Chloroethyl)ether	909	U
108-60-1	bis(2-Chloroisopropyl)ether	909	U
91-58-7	2-Chloronaphthalene	909	U
95-57-8	2-Chlorophenol	909	U
7005-72-3	4-Chlorophenylphenylether	909	U
218-01-9	Chrysene	909	U
132-64-9	Dibenzofuran	909	U
53-70-3	Dibenz(a,h)anthracene	909	U
95-50-1	1,2-Dichlorobenzene	909	U
541-73-1	1,3-Dichlorobenzene	909	U
106-46-7	1,4-Dichlorobenzene	909	U
91-94-1	3,3'-Dichlorobenzidine	1690	U
120-83-2	2,4-Dichlorophenol	390	U
84-66-2	Diethylphthalate	909	U
105-67-9	2,4-Dimethylphenol	390	U
131-11-3	Dimethylphthalate	909	U
84-74-2	Di-n-butylphthalate	909	U
534-52-1	4,6-Dinitro-2-methylphenol	4290	U
51-28-5	2,4-Dinitrophenol	4290	U
121-14-2	2,4-dinitrotoluene	909	U
606-20-2	2,6-Dinitrotoluene	909	U
117-84-0	Di-n-octylphthalate	909	U
206-44-0	Fluoranthene	909	U
86-73-7	Fluorene	909	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B5-17

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight

Lab Sample ID: 98-A68619
Date Sampled: 6/10/98
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	909	U
87-68-3	Hexachlorobutadiene	909	U
77-47-4	Hexachlorocyclopentadiene	909	U
67-72-1	Hexachloroethane	909	U
193-39-5	Indeno(1,2,3-cd)pyrene	909	U
78-59-1	Isophorone	909	U
91-57-6	2-Methylnaphthalene	909	U
95-48-7	2-Methylphenol	390	U
106-44-5	m,p-Methylphenol	390	U
91-20-3	Naphthalene	909	U
88-74-4	2-Nitroaniline	4290	U
99-09-2	3-Nitroaniline	4290	U
100-01-6	4-Nitroaniline	4290	U
98-95-3	Nitrobenzene	909	U
88-75-5	2-Nitrophenol	390	U
100-02-7	4-Nitrophenol	2080	U
621-64-7	N-nitrosodi-n-propylamine	909	U
86-30-6	N-nitrosodiphenylamine	909	U
87-86-5	Pentachlorophenol	4290	U
85-01-8	Phenanthrene	909	U
108-95-2	Phenol	390	U
129-00-0	Pyrene	909	U
117-81-7	Bis(2-ethylhexyl)phthalate	909	U
120-82-1	1,2,4-Trichlorobenzene	909	U
95-95-4	2,4,5-Trichlorophenol	4290	U
88-06-2	2,4,6-Trichlorophenol	390	U
NA	Benzyl Alcohol	1690	U

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG
Dilution Factor: 1
Analysis Method: SW8270C
Delivery Group: 103819
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/12/98
Analysis Date: 6/23/98
Analysis Time: 20:52
Sample QC Group: ~~6784~~ 51173

Extraction Date: 6/22/98

7-31-98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
83-32-9	Acenaphthene	700	....	U
208-96-8	Acenaphthylene	700	....	U
120-12-7	Anthracene	700	....	U
65-85-0	Benzoic Acid	1600	....	U
56-55-3	Benzo(a)anthracene	700	....	U
50-32-8	Benzo(a)pyrene	700	....	U
205-99-2	Benzo(b)fluoranthene	700	....	U
191-24-2	Benzo(g,h,i)perylene	700	....	U
85-68-7	Butylbenzylphthalate	700	....	U
59-50-7	4-Chloro-3-methylphenol	1300	....	U
106-47-8	4-Chloroaniline	1300	....	U
111-91-1	bis(2-Chloroethoxy)methane	700	....	U
111-44-4	bis(2-Chloroethyl)ether	700	....	U
108-60-1	bis(2-Chloroisopropyl)ether	700	....	U
91-58-7	2-Chloronaphthalene	700	....	U
95-57-8	2-Chlorophenol	700	....	U
7005-72-3	4-Chlorophenylphenylether	700	....	U
218-01-9	Chrysene	700	....	U
132-64-9	Dibenzofuran	700	....	U
53-70-3	Dibenz(a,h)anthracene	700	....	U
95-50-1	1,2-Dichlorobenzene	700	....	U
541-73-1	1,3-Dichlorobenzene	700	....	U
106-46-7	1,4-Dichlorobenzene	700	....	U
91-94-1	3,3'-Dichlorobenzidine	1300	....	U
120-83-2	2,4-Dichlorophenol	300	....	U
84-66-2	Diethylphthalate	700	....	U
105-67-9	2,4-Dimethylphenol	300	....	U
131-11-3	Dimethylphthalate	700	....	U
84-74-2	Di-n-butylphthalate	700	....	U
534-52-1	4,6-Dinitro-2-methylphenol	3300	....	U
51-28-5	2,4-Dinitrophenol	3300	....	U
121-14-2	2,4-dinitrotoluene	700	....	U
606-20-2	2,6-Dinitrotoluene	700	....	U
117-84-0	Di-n-octylphthalate	700	....	U

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/12/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
206-44-0	Fluoranthene	700	....	U
86-73-7	Fluorene	700	....	U
118-74-1	Hexachlorobenzene	700	....	U
87-68-3	Hexachlorobutadiene	700	....	U
77-47-4	Hexachlorocyclopentadiene	700	....	U
67-72-1	Hexachloroethane	700	....	U
193-39-5	Indeno(1,2,3-cd)pyrene	700	....	U
78-59-1	Isophorone	700	....	U
91-57-6	2-Methylnaphthalene	700	....	U
95-48-7	2-Methylphenol	300	....	U
106-44-5	m,p-Methylphenol	300	....	U
91-20-3	Naphthalene	700	....	U
88-74-4	2-Nitroaniline	3300	....	U
99-09-2	3-Nitroaniline	3300	....	U
100-01-6	4-Nitroaniline	3300	....	U
98-95-3	Nitrobenzene	700	....	U
88-75-5	2-Nitrophenol	300	....	U
100-02-7	4-Nitrophenol	1600	....	U
621-64-7	N-nitroso-di-n-propylamine	700	....	U
86-30-6	N-nitrosodiphenylamine	700	....	U
87-86-5	Pentachlorophenol	3300	....	U
85-01-8	Phenanthrene	700	....	U
108-95-2	Phenol	300	....	U
129-00-0	Pyrene	700	....	U
117-81-7	Bis(2-ethylhexyl)phthalate	700	....	U
120-82-1	1,2,4-Trichlorobenzene	700	....	U
95-95-4	2,4,5-Trichlorophenol	3300	....	U
88-06-2	2,4,6-Trichlorophenol	300	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B1-13.5

Matrix: Soil
% Dry Weight: 76.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: I03819
Instrument: 9001-B

Lab Sample ID: 98-A68615
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/21/98
Analysis Time: 12:14
Sample QC Group: 5897

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1320	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B3-17.5

Matrix: Soil
% Dry Weight: 78.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103819
Instrument: 9001-B

Lab Sample ID: 98-A68616
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/21/98
Analysis Time: 12:42
Sample QC Group: 5897

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	9680	....

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B4-17.5

Matrix: Soil
% Dry Weight: 91.
Units: ug/kg dry weight
Dilution Factor: 10.
Analysis Method: SW8015
Delivery Group: 103819
Instrument: 9001-B

Lab Sample ID: 98-A68617
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/21/98
Analysis Time: 13:10
Sample QC Group: 5897

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	309000....	

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B2-15

Matrix: Soil
% Dry Weight: 60.
Units: ug/kg dry weight
Dilution Factor: 50.
Analysis Method: SW8015
Delivery Group: 103819
Instrument: 9001-B

Lab Sample ID: 98-A68618
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/21/98
Analysis Time: 13:38
Sample QC Group: 5897

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	218000....	

000503

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B5-17

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103819
Instrument: 9001-B

Lab Sample ID: 98-A68619
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/21/98
Analysis Time: 14:06
Sample QC Group: 5897

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1300	U

000506

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG
Dilution Factor: 1
Analysis Method: SW8015
Delivery Group: 103819
Instrument: 9001-B

Lab Sample ID: BLANK
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/21/98
Analysis Time: 11:46
Sample QC Group: ~~4844~~ 5897 MJ 7-31-98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1000	U

000509

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B1-13.5

Matrix: Soil
% Dry Weight: 76.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103819
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A68615
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 2:11
Sample QC Group: 220

Extraction Date: 6/23/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	3260	

000562

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B3-17.5

Matrix: Soil
% Dry Weight: 78.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103819
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A68616
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 3:48
Sample QC Group: 220

Extraction Date: 6/23/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	1000	

000564

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B4-17.5

Matrix: Soil
% Dry Weight: 91.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103819
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A68617
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 4:36
Sample QC Group: 220

Extraction Date: 6/23/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	8840	

000566

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B2-15

Matrix: Soil
% Dry Weight: 60.
Units: ug/kg dry weight
Dilution Factor: 100.
Analysis Method: SW8015
Delivery Group: 103819
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 2.0 ml

Lab Sample ID: 98-A68618
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 5:25
Sample QC Group: 220

Extraction Date: 6/23/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	16400	

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B5-17

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103819
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A68619
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 6:13
Sample QC Group: 220

Extraction Date: 6/23/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	4000	

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG
Dilution Factor: 1
Analysis Method: SW8270B
Delivery Group: 103819
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: BLANK
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: ~~2211~~ 22:55 AN 8-5-98
Sample QC Group: ~~4885~~ 220

Extraction Date: 6/23/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	10000	U

AN

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B2-3

Matrix: Soil
% Dry Weight: 80.
Units: mg/kg dry weight
Dilution Factor: 1.
Analysis Method: SW6010B
Delivery Group: 103819
Instrument: TRACE
Mercury DilFact: 1.
Mercury Method: SW7141
Mercury Instrument: PS-200

Lab Sample ID: 98-A68620
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 10:02
Sample QC Group: 5758

Mercury Date: 6/24/98
Mercury Time: 23:59
Mercury QC Group: 5917

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
7429-90-5	Aluminum	17600	....	
7440-36-0	Antimony	49.9	....	U
7440-38-2	Arsenic	3.31	....	J
7440-39-3	Barium	89.9	....	
7440-41-7	Beryllium	0.38	....	U
7440-43-9	Cadmium	4.99	....	U
7440-47-3	Chromium	14.2	....	
7440-48-4	Cobalt	4.24	....	J
7440-50-8	Copper	3.49	....	J
7439-92-1	Lead	15.0	....	J
7439-96-5	Manganese	312.	....	
7439-97-6	Mercury	0.12	....	U
7439-98-7	Molybdenum	9.98	....	U
7440-02-0	Nickel	9.98	....	J
7782-49-2	Selenium	99.8	....	U
7440-22-4	Silver	8.74	....	U
7440-28-0	Thallium	49.9	....	U
7440-62-2	Vanadium	14.5	....	
7440-66-6	Zinc	39.4	....	

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-BS-1

Matrix: Soil
% Dry Weight: 98.
Units: mg/kg dry weight
Dilution Factor: 1.
Analysis Method: SW6010B
Delivery Group: 103819
Instrument: TRACE
Mercury DilFact: 1.
Mercury Method: SW7141
Mercury Instrument: PS-200

Lab Sample ID: 98-A68621
Date Sampled: 6/10/98
Date Received: 6/12/98
Analysis Date: 6/24/98
Analysis Time: 10:32
Sample QC Group: 5758

Mercury Date: 6/24/98
Mercury Time: 23:59
Mercury QC Group: 5917

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
7429-90-5	Aluminum	5320	....	
7440-36-0	Antimony	40.9	....	U
7440-38-2	Arsenic	2.53	....	J
7440-39-3	Barium	26.2	....	
7440-41-7	Beryllium	0.31	....	U
7440-43-9	Cadmium	4.09	....	U
7440-47-3	Chromium	4.91	....	J
7440-48-4	Cobalt	7.15	....	U
7440-50-8	Copper	2.04	....	J
7439-92-1	Lead	16.3	....	J
7439-96-5	Manganese	107.	....	
7439-97-6	Mercury	0.10	....	U
7439-98-7	Molybdenum	8.18	....	U
7440-02-0	Nickel	5.05	....	J
7782-49-2	Selenium	81.8	....	U
7440-22-4	Silver	7.15	....	U
7440-28-0	Thallium	40.9	....	U
7440-62-2	Vanadium	6.54	....	J
7440-66-6	Zinc	17.6	....	

000609

Sample Identification

BLANK

Matrix: Soil
pH:
Units: MG/KG
Dilution Factor: 1
Analysis Method: SW6010B
Delivery Group: 103819
Instrument: TRACE
Mercury DilFact: 1
Mercury Method: SW7141
Instrument: PS-200

Lab Sample ID: BLANK
Date Sampled:
Date Received:
Analysis Date: 6/24/98
Analysis Time: 10:02
Sample QC Group: 6850

Mercury Date: 6/24/98
Mercury Time: 23:59
Mercury QC Group: 6843

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
7429-90-5	Aluminum	50.0	....	U
7440-36-0	Antimony	40.0	....	U
7440-38-2	Arsenic	60.0	....	U
7440-39-3	Barium	2.00	....	U
7440-41-7	Beryllium	0.30	....	U
7440-43-9	Cadmium	4.00	....	U
7440-47-3	Chromium	7.00	....	U
7440-48-4	Cobalt	7.00	....	U
7440-50-8	Copper	6.00	....	U
7439-92-1	Lead	50.0	....	U
7439-96-5	Manganese	2.00	....	U
7439-97-6	Mercury	0.10	....	U
7439-98-7	Molybdenum	8.00	....	U
7440-02-0	Nickel	15.0	....	U
7782-49-2	Selenium	80.0	....	U
7440-22-4	Silver	7.00	....	U
7440-28-0	Thallium	40.0	....	U
7440-62-2	Vanadium	8.00	....	U
7440-66-6	Zinc	2.00	....	U

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Case Narrative
SDG 103948
(8/4/98)

Client: **Parsons Engineering Sciences, Inc.**
1700 Broadway, Suite 900
Denver, Colorado 80290

Client Project Number: 726876.19122

Matrix: Water/Soil

Laboratory Project Number: 103948

Number of Samples: 2 Water
15 Soil

Date Received: 6/13/98

Date Collected: 6/12/98

Sample Receipt

Two water samples and fifteen soil samples were received in good condition at 4° C on 6/13/98. The analysis requested included volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (TPH), and metals. Both purgeable (VPH) and extractable petroleum hydrocarbons (EPH) were requested. All analysis was conducted following Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846). Specific methods used include the following:

SW-846 Method 8260B, VOCs
SW-846 Method 8270C, SVOCs
SW-846 Method 8015B, VPH and EPH
SW-846 Method 6010/7000, metals

Volatile Organic Compounds, Method 8260B

Water

All instrument calibrations, internal standards, and surrogate results associated with the samples were within method or laboratory acceptance criteria. The sample was analyzed as part of analytical batch 6302.

Matrix spike/matrix spike duplicate (MS/MSD) analysis was conducted on a sample from another delivery group. All MS and MSD sample exhibited acceptable recoveries for all spike compounds and all relative percent difference (RPD) values. All compounds were within acceptable limits for the laboratory control standard (LCS).

Soil
All instrument calibrations associated with the samples were within method or laboratory acceptance criteria. The sample was analyzed as part of analytical batch 6741. Surrogate and internal standard recoveries for sample FC2-B11-18.5 exceeded recovery limits and internal area counts on the initial analysis. The dilution analysis of this sample was within acceptable limits for both surrogates and internal standards.

MS/MSD analysis was conducted on sample FC2-B6-3.0. All recoveries and RPD values were within method and laboratory established limits. All compound recoveries were within laboratory established limits for the LSC.

General
Sample quantitation was conducted using relative response factors for all compounds with relative standard deviations (RSDs) equal to or less than 15% for all non-calibration check compounds. If the RSD exceeded 15%, calibration curves were used for sample quantitation. Copies of the curves generated for all compounds with RSDs greater than 15% have been supplied.

Semivolatile Organic Compounds, Method 82070C

Water
All instrument calibration, internal standard and surrogate recoveries were within method or laboratory acceptance criteria. The water sample was analyzed in analytical batch 6324.

MS/MSD results associated with the sample was within laboratory or method established limits. MS/MSD analysis was conducted on a laboratory blank spike pair. Five compounds exceeded laboratory-established limits in the LCS sample.

Soil
The soil samples were analyzed as one analytical batch. The batch is 6409. All instrument calibration, were within method or laboratory acceptance criteria. As expected, in the three samples requiring dilution analysis the surrogates were diluted out of range. Internal standard area counts were outside of method limits for the matrix spike and matrix spike duplicate. All environmental samples had acceptable internal standard area counts.

MS/MSD analysis was conducted on sample FC2-B6-19.0. MS/MSD recoveries were acceptable but the RPD values were outside of range for three spike compounds. Three compounds exceeded laboratory-established limits in the LCS sample.

General
As with the VOCs sample quantitation was conducted using response factor for all compounds with less that 15 % RSD. For compounds with greater then 15 % RSD calibration cures were used. Calibration curves have been supplied where appropriate

Purgeable Petroleum Hydrocarbons, Method 8015B

Water
The one volatile TPH water sample was analyzed in analytical batch 6622. All internal standards, calibration and surrogate results were within method or laboratory acceptance criteria.

The MS/MSD and laboratory control standard results exhibited acceptable recoveries for spiked fuels. MS/MSD analysis was conducted on a sample from another delivery group.

Soil
Soil volatile TPH samples were analyzed in analytical batch 6621. All internal standards, calibration and surrogate results were within method or laboratory acceptance criteria. The MS/MSD and laboratory control standard results exhibited acceptable recoveries for spiked fuels. MS/MSD analysis was conducted on sample FC2-B7-17.0.

Extractable Petroleum Hydrocarbons, Method 8015B

Water
The one water sample was analyzed in analytical batch 6316. All calibration and surrogate results were within method or laboratory acceptance criteria. The MS/MSD and laboratory control standard results exhibited acceptable recoveries for spiked fuels. MS/MSD RPD value for diesel fuel exceeded laboratory-established limits. MS/MSD analysis was conducted on a laboratory blank spike pair.

Soil
EPH soils were analyzed as analytical batch 6616. All calibration results were within method or laboratory acceptance criteria. Surrogate recoveries were diluted out of range for three samples requiring dilution analysis. Sample FC2-B6-3.0 was used for MS/MSD analysis. This was one of the samples requiring dilution analysis. The MS/MSD spike diesel fuel was also diluted out and MS/MSD recoveries and RPD values were not possible to calculate. LCS results exhibited acceptable recoveries for spiked fuels.

Metals, Method 6010/7000

All metal laboratory control, blank, calibration and duplicate results were within laboratory or method required limits. The samples were prepared for ICP metals in preparation batch 5015. Mercury was prepared in batch 5026. The sample duplicate, spike and laboratory control results present on the CLP like Forms 5-7 are not the historical limits used by the laboratory. Laboratory established limits are supplied on the attached table.

Paula Watts
Technical Services
Specialized Assays, Inc

SPECIALIZED ASSAYS, INC.

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Sample Identification

EQUIP. BLANK 2

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-8

Lab Sample ID: 98-A69160
Date Sampled:: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/20/98
Analysis Time: 19:39
Sample QC Group: 6302

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	0.5	....	U
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U
87-68-3	Hexachlorobutadiene	1.1	....	U
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U

SPECIALIZED ASSAYS, INC.

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Phone 1-615-726-0177

Sample Identification

EQUIP. BLANK 2

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A69160
Date Sampled:: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	0.3	U
91-20-3	Naphthalene	0.4	U
103-65-1	n-Propylbenzene	0.4	U
100-42-5	Styrene	0.4	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	U
127-18-4	Tetrachloroethene	1.4	U
108-88-3	Toluene	1.1	U
87-61-6	1,2,3-Trichlorobenzene	0.3	U
120-82-1	1,2,4-Trichlorobenzene	0.4	U
71-55-6	1,1,1-Trichloroethane	0.8	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	3.2	U
95-63-6	1,2,4-Trimethylbenzene	1.3	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
75-01-4	Vinyl chloride	1.1	U
75-27-4	Bromodichloromethane	0.8	U
95-47-6	o-Xylene	1.1	U
108-38-3	m,p-Xylene	0.5	U
75-69-4	Trichlorofluoromethane	0.8	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

TB-3

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-8

Lab Sample ID: 98-A69161
Date Sampled:: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/20/98
Analysis Time: 20:52
Sample QC Group: 6302

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	0.5	U
71-43-2	Benzene	0.4	U
108-86-1	Bromobenzene	0.3	U
74-97-5	Bromochloromethane	0.4	U
75-25-2	Bromoform	1.2	U
74-83-9	Bromomethane	1.1	U
104-51-8	n-Butylbenzene	1.1	U
135-98-8	sec-Butylbenzene	1.3	U
98-06-6	t-Butylbenzene	1.4	U
56-23-5	Carbon tetrachloride	2.1	U
108-90-7	Chlorobenzene	0.4	U
75-00-3	Chloroethane	1.0	U
67-66-3	Chloroform	0.3	U
74-87-3	Chloromethane	1.3	U
95-49-8	2-Chlorotoluene	0.4	U
106-43-4	4-Chlorotoluene	0.6	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	U
124-48-1	Dibromochloromethane	0.5	U
74-95-3	1,2-Dibromoethane	0.6	U
74-95-3	Dibromomethane	2.4	U
95-50-1	1,2-Dichlorobenzene	0.3	U
541-73-1	1,3-Dichlorobenzene	1.2	U
106-46-7	1,4-Dichlorobenzene	0.3	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	0.4	U
107-06-2	1,2-Dichloroethane	0.6	U
75-35-4	1,1-Dichloroethene	1.2	U
156-59-2	cis-1,2-Dichloroethene	1.2	U
156-60-5	trans-1,2-Dichloroethene	0.6	U
78-87-5	1,2-Dichloropropane	0.4	U
142-28-9	1,3-Dichloropropane	0.4	U
594-20-7	2,2-Dichloropropane	3.5	U
563-58-6	1,1-Dichloropropene	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
100-41-4	Ethylbenzene	0.6	U
87-68-3	Hexachlorobutadiene	1.1	U
98-82-8	Isopropylbenzene	0.5	U
99-87-6	4-Isopropyltoluene	1.2	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

TB-3

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A69161
Date Sampled:: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	0.3	U
91-20-3	Naphthalene	0.4	U
103-65-1	n-Propylbenzene	0.4	U
100-42-5	Styrene	0.4	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	U
127-18-4	Tetrachloroethene	1.4	U
108-88-3	Toluene	1.1	U
87-61-6	1,2,3-Trichlorobenzene	0.3	U
120-82-1	1,2,4-Trichlorobenzene	0.4	U
71-55-6	1,1,1-Trichloroethane	0.8	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
96-18-4	1,2,3-Trichloropropane	3.2	U
95-63-6	1,2,4-Trimethylbenzene	1.3	U
108-67-8	1,3,5-Trimethylbenzene	0.5	U
75-01-4	Vinyl chloride	1.1	U
75-27-4	Bromodichloromethane	0.8	U
95-47-6	o-Xylene	1.1	U
108-38-3	m,p-Xylene	0.5	U
75-69-4	Trichlorofluoromethane	0.8	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L
Dilution Factor: 1
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-8

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/13/98
Analysis Date: 6/20/98
Analysis Time: 16:34
Sample QC Group: 3302

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	0.5	....	U
71-43-2	Benzene	0.4	....	U
108-86-1	Bromobenzene	0.3	....	U
74-97-5	Bromochloromethane	0.4	....	U
75-25-2	Bromoform	1.2	....	U
74-83-9	Bromomethane	1.1	....	U
104-51-8	n-Butylbenzene	1.1	....	U
135-98-8	sec-Butylbenzene	1.3	....	U
98-06-6	t-Butylbenzene	1.4	....	U
56-23-5	Carbon tetrachloride	2.1	....	U
108-90-7	Chlorobenzene	0.4	....	U
75-00-3	Chloroethane	1.0	....	U
67-66-3	Chloroform	0.3	....	U
74-87-3	Chloromethane	1.3	....	U
95-49-8	2-Chlorotoluene	0.4	....	U
106-43-4	4-Chlorotoluene	0.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	2.6	....	U
124-48-1	Dibromochloromethane	0.5	....	U
74-95-3	1,2-Dibromoethane	0.6	....	U
74-95-3	Dibromomethane	2.4	....	U
95-50-1	1,2-Dichlorobenzene	0.3	....	U
541-73-1	1,3-Dichlorobenzene	1.2	....	U
106-46-7	1,4-Dichlorobenzene	0.3	....	U
75-71-8	Dichlorodifluoromethane	1.0	....	U
75-34-3	1,1-Dichloroethane	0.4	....	U
107-06-2	1,2-Dichloroethane	0.6	....	U
75-35-4	1,1-Dichloroethene	1.2	....	U
156-59-2	cis-1,2-Dichloroethene	1.2	....	U
156-60-5	trans-1,2-Dichloroethene	0.6	....	U
78-87-5	1,2-Dichloropropane	0.4	....	U
142-28-9	1,3-Dichloropropane	0.4	....	U
594-20-7	2,2-Dichloropropane	3.5	....	U
563-58-6	1,1-Dichloropropene	1.0	....	U
10061-01-5	cis-1,3-Dichloropropene	1.0	....	U
10061-02-6	trans-1,3-Dichloropropene	1.0	....	U
100-41-4	Ethylbenzene	0.6	....	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
87-68-3	Hexachlorobutadiene	1.1	....	U
98-82-8	Isopropylbenzene	0.5	....	U
99-87-6	4-Isopropyltoluene	1.2	....	U
75-09-2	Methylene chloride	0.3	....	U
91-20-3	Naphthalene	0.4	....	U
103-65-1	n-Propylbenzene	0.4	....	U
100-42-5	Styrene	0.4	....	U
630-20-6	1,1,1,2-Tetrachloroethane	0.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	0.4	....	U
127-18-4	Tetrachloroethene	1.4	....	U
108-88-3	Toluene	1.1	....	U
87-61-6	1,2,3-Trichlorobenzene	0.3	....	U
120-82-1	1,2,4-Trichlorobenzene	0.4	....	U
71-55-6	1,1,1-Trichloroethane	0.8	....	U
79-00-5	1,1,2-Trichloroethane	1.0	....	U
79-01-6	Trichloroethene	1.0	....	U
96-18-4	1,2,3-Trichloropropane	3.2	....	U
95-63-6	1,2,4-Trimethylbenzene	1.3	....	U
108-67-8	1,3,5-Trimethylbenzene	0.5	....	U
75-01-4	Vinyl chloride	1.1	....	U
75-27-4	Bromodichloromethane	0.8	....	U
95-47-6	o-Xylene	1.1	....	U
108-38-3	m,p-Xylene	0.5	....	U
75-69-4	Trichlorofluoromethane	0.8	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-3.0

Matrix: Soil
% Dry Weight: 92.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69166
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/98
Analysis Time: 0:59
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	3.3	U
71-43-2	Benzene	10.9	U
108-86-1	Bromobenzene	10.9	U
124-48-1	Bromochloromethane	10.9	U
75-25-2	Bromoform	32.6	U
74-83-9	Bromomethane	27.2	U
104-51-8	n-Butylbenzene	27.2	U
135-98-8	sec-Butylbenzene	38.0	U
98-06-6	t-Butylbenzene	38.0	U
56-23-5	Carbon tetrachloride	54.3	U
108-90-7	Chlorobenzene	10.9	U
75-00-3	Chloroethane	27.2	U
67-66-3	Chloroform	10.9	U
74-87-3	Chloromethane	38.0	U
95-49-8	2-Chlorotoluene	10.9	U
106-43-4	4-Chlorotoluene	16.3	U
96-12-8	1,2-Dibromo-3-chloropropane	5.4	U
124-48-1	Dibromochloromethane	16.3	U
74-95-3	1,2-Dibromoethane	16.3	U
74-95-3	Dibromomethane	54.3	U
95-50-1	1,2-Dichlorobenzene	10.9	U
541-73-1	1,3-Dichlorobenzene	32.6	U
106-46-7	1,4-Dichlorobenzene	10.9	U
75-71-8	Dichlorodifluoromethane	27.2	U
75-34-3	1,1-Dichloroethane	10.9	U
107-06-2	1,2-Dichloroethane	16.3	U
75-35-4	1,1-Dichloroethene	32.6	U
156-59-2	cis-1,2-Dichloroethene	32.6	U
156-60-5	trans-1,2-Dichloroethene	16.3	U
78-87-5	1,2-Dichloropropane	10.9	U
142-28-9	1,3-Dichloropropane	10.9	U
594-20-7	2,2-Dichloropropane	109.	U
563-58-6	1,1-Dichloropropene	27.2	U
10061-01-5	cis-1,3-Dichloropropene	27.2	U
10061-02-6	trans-1,3-Dichloropropene	27.2	U
100-41-4	Ethylbenzene	2600	
87-68-3	Hexachlorobutadiene	27.2	U
98-82-8	Isopropylbenzene	891.	
99-87-6	4-Isopropyltoluene	734.	

000129

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-3.0

Matrix: Soil
% Dry Weight: 92.
Units: ug/kg dry weight

Lab Sample ID: 98-A69166
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	10.9	U
91-20-3	Naphthalene	1090	
103-65-1	n-Propylbenzene	1680	
100-42-5	Styrene	10.9	U
630-20-6	1,1,1,2-Tetrachloroethane	16.3	U
79-34-5	1,1,2,2-Tetrachloroethane	10.9	U
127-18-4	Tetrachloroethene	38.0	U
108-88-3	Toluene	125.	
87-61-6	1,2,3-Trichlorobenzene	10.9	U
120-82-1	1,2,4-Trichlorobenzene	10.9	U
71-55-6	1,1,1-Trichloroethane	21.7	U
79-00-5	1,1,2-Trichloroethane	27.2	U
79-01-6	Trichloroethene	54.3	U
96-18-4	1,2,3-Trichloropropane	109.	U
95-63-6	1,2,4-Trimethylbenzene	5160	
108-67-8	1,3,5-Trimethylbenzene	5970	
75-01-4	Vinyl chloride	48.9	U
75-27-4	Bromodichloromethane	21.7	U
6615	o-Xylene	500.	
6616	m,p-Xylene	5520	
75-69-4	Trichlorofluoromethane	21.7	U

000130

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-3.0

Matrix: Soil
% Dry Weight: 92.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69166
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/30/98
Analysis Time: 19:51
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	408.	U
71-43-2	Benzene	272.	U
108-86-1	Bromobenzene	272.	U
124-48-1	Bromochloromethane	272.	U
75-25-2	Bromoform	815.	U
74-83-9	Bromomethane	679.	U
104-51-8	n-Butylbenzene	679.	U
135-98-8	sec-Butylbenzene	951.	U
98-06-6	t-Butylbenzene	951.	U
56-23-5	Carbon tetrachloride	1360	U
108-90-7	Chlorobenzene	272.	U
75-00-3	Chloroethane	679.	U
67-66-3	Chloroform	272.	U
74-87-3	Chloromethane	951.	U
95-49-8	2-Chlorotoluene	272.	U
106-43-4	4-Chlorotoluene	408.	U
96-12-8	1,2-Dibromo-3-chloropropane	136.	U
124-48-1	Dibromochloromethane	408.	U
74-95-3	1,2-Dibromoethane	408.	U
74-95-3	Dibromomethane	1360	U
95-50-1	1,2-Dichlorobenzene	272.	U
541-73-1	1,3-Dichlorobenzene	815.	U
106-46-7	1,4-Dichlorobenzene	272.	U
75-71-8	Dichlorodifluoromethane	679.	U
75-34-3	1,1-Dichloroethane	272.	U
107-06-2	1,2-Dichloroethane	408.	U
75-35-4	1,1-Dichloroethene	815.	U
156-59-2	cis-1,2-Dichloroethene	815.	U
156-60-5	trans-1,2-Dichloroethene	408.	U
78-87-5	1,2-Dichloropropane	272.	U
142-28-9	1,3-Dichloropropane	272.	U
594-20-7	2,2-Dichloropropane	2720	U
563-58-6	1,1-Dichloropropene	679.	U
10061-01-5	cis-1,3-Dichloropropene	679.	U
10061-02-6	trans-1,3-Dichloropropene	679.	U
100-41-4	Ethylbenzene	679.	U
87-68-3	Hexachlorobutadiene	1090	U
98-82-8	Isopropylbenzene	815.	U
99-87-6	4-Isopropyltoluene		

COPY 1

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-3.0

Matrix: Soil
% Dry Weight: 92.
Units: ug/kg dry weight

Lab Sample ID: 98-A69166
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	272.	U
91-20-3	Naphthalene	272.	U
103-65-1	n-Propylbenzene	408.	
100-42-5	Styrene	272.	U
630-20-6	1,1,1,2-Tetrachloroethane	408.	U
79-34-5	1,1,2,2-Tetrachloroethane	272.	U
127-18-4	Tetrachloroethene	951.	U
108-88-3	Toluene	679.	U
87-61-6	1,2,3-Trichlorobenzene	272.	U
120-82-1	1,2,4-Trichlorobenzene	272.	U
71-55-6	1,1,1-Trichloroethane	543.	U
79-00-5	1,1,2-Trichloroethane	679.	U
79-01-6	Trichloroethene	1360	U
96-18-4	1,2,3-Trichloropropane	2720	U
95-63-6	1,2,4-Trimethylbenzene	1090	
108-67-8	1,3,5-Trimethylbenzene	679.	
75-01-4	Vinyl chloride	1220	U
75-27-4	Bromodichloromethane	543.	U
6615	o-Xylene	679.	U
6616	m,p-Xylene	1220	
75-69-4	Trichlorofluoromethane	543.	U

000139

COPY 1

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-19.0

Matrix: Soil
% Dry Weight: 96.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69167
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/98
Analysis Time: 1:34
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	3.1	....	U
71-43-2	Benzene	2.1	....	U
108-86-1	Bromobenzene	2.1	....	U
124-48-1	Bromochloromethane	2.1	....	U
75-25-2	Bromoform	6.2	....	U
74-83-9	Bromomethane	5.2	....	U
104-51-8	n-Butylbenzene	5.2	....	U
135-98-8	sec-Butylbenzene	7.3	....	U
98-06-6	t-Butylbenzene	7.3	....	U
56-23-5	Carbon tetrachloride	10.4	....	U
108-90-7	Chlorobenzene	2.1	....	U
75-00-3	Chloroethane	5.2	....	U
67-66-3	Chloroform	2.1	....	U
74-87-3	Chloromethane	7.3	....	U
95-49-8	2-Chlorotoluene	2.1	....	U
106-43-4	4-Chlorotoluene	3.1	....	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	....	U
124-48-1	Dibromochloromethane	3.1	....	U
74-95-3	1,2-Dibromoethane	3.1	....	U
74-95-3	Dibromomethane	10.4	....	U
95-50-1	1,2-Dichlorobenzene	2.1	....	U
541-73-1	1,3-Dichlorobenzene	6.2	....	U
106-46-7	1,4-Dichlorobenzene	2.1	....	U
75-71-8	Dichlorodifluoromethane	5.2	....	U
75-34-3	1,1-Dichloroethane	2.1	....	U
107-06-2	1,2-Dichloroethane	3.1	....	U
75-35-4	1,1-Dichloroethene	6.2	....	U
156-59-2	cis-1,2-Dichloroethene	6.2	....	U
156-60-5	trans-1,2-Dichloroethene	3.1	....	U
78-87-5	1,2-Dichloropropane	2.1	....	U
142-28-9	1,3-Dichloropropane	2.1	....	U
594-20-7	2,2-Dichloropropane	20.8	....	U
563-58-6	1,1-Dichloropropene	5.2	....	U
10061-01-5	cis-1,3-Dichloropropene	5.2	....	U
10061-02-6	trans-1,3-Dichloropropene	5.2	....	U
100-41-4	Ethylbenzene	3.1	....	U
87-68-3	Hexachlorobutadiene	5.2	....	U
98-82-8	Isopropylbenzene	8.3	....	U
99-87-6	4-Isopropyltoluene	6.2	....	U

000145

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-19.0

Matrix: Soil
% Dry Weight: 96.
Units: ug/kg dry weight

Lab Sample ID: 98-A69167
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	2.1	U
91-20-3	Naphthalene	2.1	U
103-65-1	n-Propylbenzene	2.1	U
100-42-5	Styrene	2.1	U
630-20-6	1,1,1,2-Tetrachloroethane	3.1	U
79-34-5	1,1,2,2-Tetrachloroethane	2.1	U
127-18-4	Tetrachloroethene	7.3	U
108-88-3	Toluene	5.2	U
87-61-6	1,2,3-Trichlorobenzene	2.1	U
120-82-1	1,2,4-Trichlorobenzene	2.1	U
71-55-6	1,1,1-Trichloroethane	4.2	U
79-00-5	1,1,2-Trichloroethane	5.2	U
79-01-6	Trichloroethene	10.4	U
96-18-4	1,2,3-Trichloropropane	20.8	U
95-63-6	1,2,4-Trimethylbenzene	7.3	U
108-67-8	1,3,5-Trimethylbenzene	3.1	U
75-01-4	Vinyl chloride	9.4	U
75-27-4	Bromodichloromethane	4.2	U
6615	o-Xylene	5.2	U
6616	m,p-Xylene	3.1	U
75-69-4	Trichlorofluoromethane	4.2	U

000146

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-17.0

Matrix: Soil
% Dry Weight: 74.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69168
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/98
Analysis Time: 2:10
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	4.1	....	U
71-43-2	Benzene	2.7	....	U
108-86-1	Bromobenzene	2.7	....	U
124-48-1	Bromochloromethane	2.7	....	U
75-25-2	Bromoform	8.1	....	U
74-83-9	Bromomethane	6.8	....	U
104-51-8	n-Butylbenzene	6.8	....	U
135-98-8	sec-Butylbenzene	9.5	....	U
98-06-6	t-Butylbenzene	9.5	....	U
56-23-5	Carbon tetrachloride	13.5	....	U
108-90-7	Chlorobenzene	2.7	....	U
75-00-3	Chloroethane	6.8	....	U
67-66-3	Chloroform	2.7	....	U
74-87-3	Chloromethane	9.5	....	U
95-49-8	2-Chlorotoluene	2.7	....	U
106-43-4	4-Chlorotoluene	4.1	....	U
96-12-8	1,2-Dibromo-3-chloropropane	1.4	....	U
124-48-1	Dibromochloromethane	4.1	....	U
74-95-3	1,2-Dibromoethane	4.1	....	U
74-95-3	Dibromomethane	13.5	....	U
95-50-1	1,2-Dichlorobenzene	2.7	....	U
541-73-1	1,3-Dichlorobenzene	8.1	....	U
106-46-7	1,4-Dichlorobenzene	2.7	....	U
75-71-8	Dichlorodifluoromethane	6.8	....	U
75-34-3	1,1-Dichloroethane	2.7	....	U
107-06-2	1,2-Dichloroethane	4.1	....	U
75-35-4	1,1-Dichloroethene	8.1	....	U
156-59-2	cis-1,2-Dichloroethene	8.1	....	U
156-60-5	trans-1,2-Dichloroethene	4.1	....	U
78-87-5	1,2-Dichloropropane	2.7	....	U
142-28-9	1,3-Dichloropropane	2.7	....	U
594-20-7	2,2-Dichloropropane	27.0	....	U
563-58-6	1,1-Dichloropropene	6.8	....	U
10061-01-5	cis-1,3-Dichloropropene	6.8	....	U
10061-02-6	trans-1,3-Dichloropropene	6.8	....	U
100-41-4	Ethylbenzene	4.1	....	U
87-68-3	Hexachlorobutadiene	6.8	....	U
98-82-8	Isopropylbenzene	10.8	....	U
99-87-6	4-Isopropyltoluene	8.1	....	U

000149

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-17.0

Matrix: Soil
% Dry Weight: 74.
Units: ug/kg dry weight

Lab Sample ID: 98-A69168
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	2.7	U
91-20-3	Naphthalene	2.7	U
103-65-1	n-Propylbenzene	2.7	U
100-42-5	Styrene	2.7	U
630-20-6	1,1,1,2-Tetrachloroethane	4.1	U
79-34-5	1,1,2,2-Tetrachloroethane	2.7	U
127-18-4	Tetrachloroethene	9.5	U
108-88-3	Toluene	6.8	U
87-61-6	1,2,3-Trichlorobenzene	2.7	U
120-82-1	1,2,4-Trichlorobenzene	2.7	U
71-55-6	1,1,1-Trichloroethane	5.4	U
79-00-5	1,1,2-Trichloroethane	6.8	U
79-01-6	Trichloroethene	13.5	U
96-18-4	1,2,3-Trichloropropane	27.0	U
95-63-6	1,2,4-Trimethylbenzene	9.5	U
108-67-8	1,3,5-Trimethylbenzene	4.1	U
75-01-4	Vinyl chloride	12.2	U
75-27-4	Bromodichloromethane	5.4	U
6615	o-Xylene	6.8	U
6616	m,p-Xylene	4.1	U
75-69-4	Trichlorofluoromethane	5.4	U

000150

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-D

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69169
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/98
Analysis Time: 2:46
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	3.9	....	U
71-43-2	Benzene	13.0	....	U
108-86-1	Bromobenzene	13.0	....	U
124-48-1	Bromochloromethane	13.0	....	U
75-25-2	Bromoform	39.0	....	U
74-83-9	Bromomethane	32.5	....	U
104-51-8	n-Butylbenzene	32.5	....	U
135-98-8	sec-Butylbenzene	45.5	....	U
98-06-6	t-Butylbenzene	45.5	....	U
56-23-5	Carbon tetrachloride	64.9	....	U
108-90-7	Chlorobenzene	13.0	....	U
75-00-3	Chloroethane	32.5	....	U
67-66-3	Chloroform	13.0	....	U
74-87-3	Chloromethane	45.5	....	U
95-49-8	2-Chlorotoluene	13.0	....	U
106-43-4	4-Chlorotoluene	19.5	....	U
96-12-8	1,2-Dibromo-3-chloropropane	6.5	....	U
124-48-1	Dibromochloromethane	19.5	....	U
74-95-3	1,2-Dibromoethane	19.5	....	U
74-95-3	Dibromomethane	64.9	....	U
95-50-1	1,2-Dichlorobenzene	13.0	....	U
541-73-1	1,3-Dichlorobenzene	39.0	....	U
106-46-7	1,4-Dichlorobenzene	13.0	....	U
75-71-8	Dichlorodifluoromethane	32.5	....	U
75-34-3	1,1-Dichloroethane	13.0	....	U
107-06-2	1,2-Dichloroethane	19.5	....	U
75-35-4	1,1-Dichloroethene	39.0	....	U
156-59-2	cis-1,2-Dichloroethene	39.0	....	U
156-60-5	trans-1,2-Dichloroethene	19.5	....	U
78-87-5	1,2-Dichloropropane	13.0	....	U
142-28-9	1,3-Dichloropropane	13.0	....	U
594-20-7	2,2-Dichloropropane	130.	....	U
563-58-6	1,1-Dichloropropene	32.5	....	U
10061-01-5	cis-1,3-Dichloropropene	32.5	....	U
10061-02-6	trans-1,3-Dichloropropene	32.5	....	U
100-41-4	Ethylbenzene	19.5	....	U
87-68-3	Hexachlorobutadiene	32.5	....	U
98-82-8	Isopropylbenzene	51.9	....	U
99-87-6	4-Isopropyltoluene	39.0	....	U

000153

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-D

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight

Lab Sample ID: 98-A69169
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
75-09-2	Methylene chloride	13.0	....	U
91-20-3	Naphthalene	13.0	....	U
103-65-1	n-Propylbenzene	13.0	....	U
100-42-5	Styrene	13.0	....	U
630-20-6	1,1,1,2-Tetrachloroethane	19.5	....	U
79-34-5	1,1,2,2-Tetrachloroethane	13.0	....	U
127-18-4	Tetrachloroethene	45.5	....	U
108-88-3	Toluene	32.5	....	U
87-61-6	1,2,3-Trichlorobenzene	13.0	....	U
120-82-1	1,2,4-Trichlorobenzene	13.0	....	U
71-55-6	1,1,1-Trichloroethane	26.0	....	U
79-00-5	1,1,2-Trichloroethane	32.5	....	U
79-01-6	Trichloroethene	64.9	....	U
96-18-4	1,2,3-Trichloropropane	130.	....	U
95-63-6	1,2,4-Trimethylbenzene	45.5	....	U
108-67-8	1,3,5-Trimethylbenzene	19.5	....	U
75-01-4	Vinyl chloride	58.4	....	U
75-27-4	Bromodichloromethane	26.0	....	U
6615	o-Xylene	32.5	....	U
6616	m,p-Xylene	19.5	....	U
75-69-4	Trichlorofluoromethane	26.0	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-19.0

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69170
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/98
Analysis Time: 3:21
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	3.6	....	U
71-43-2	Benzene	2.4	....	U
108-86-1	Bromobenzene	2.4	....	U
124-48-1	Bromochloromethane	2.4	....	U
75-25-2	Bromoform	7.1	....	U
74-83-9	Bromomethane	6.0	....	U
104-51-8	n-Butylbenzene	6.0	....	U
135-98-8	sec-Butylbenzene	8.3	....	U
98-06-6	t-Butylbenzene	8.3	....	U
56-23-5	Carbon tetrachloride	11.9	....	U
108-90-7	Chlorobenzene	2.4	....	U
75-00-3	Chloroethane	6.0	....	U
67-66-3	Chloroform	2.4	....	U
74-87-3	Chloromethane	8.3	....	U
95-49-8	2-Chlorotoluene	2.4	....	U
106-43-4	4-Chlorotoluene	3.6	....	U
96-12-8	1,2-Dibromo-3-chloropropane	1.2	....	U
124-48-1	Dibromochloromethane	3.6	....	U
74-95-3	1,2-Dibromoethane	3.6	....	U
74-95-3	Dibromomethane	11.9	....	U
95-50-1	1,2-Dichlorobenzene	2.4	....	U
541-73-1	1,3-Dichlorobenzene	7.1	....	U
106-46-7	1,4-Dichlorobenzene	2.4	....	U
75-71-8	Dichlorodifluoromethane	6.0	....	U
75-34-3	1,1-Dichloroethane	2.4	....	U
107-06-2	1,2-Dichloroethane	3.6	....	U
75-35-4	1,1-Dichloroethene	7.1	....	U
156-59-2	cis-1,2-Dichloroethene	7.1	....	U
156-60-5	trans-1,2-Dichloroethene	3.6	....	U
78-87-5	1,2-Dichloropropane	2.4	....	U
142-28-9	1,3-Dichloropropane	2.4	....	U
594-20-7	2,2-Dichloropropane	23.8	....	U
563-58-6	1,1-Dichloropropene	6.0	....	U
10061-01-5	cis-1,3-Dichloropropene	6.0	....	U
10061-02-6	trans-1,3-Dichloropropene	6.0	....	U
100-41-4	Ethylbenzene	3.6	....	U
87-68-3	Hexachlorobutadiene	6.0	....	U
98-82-8	Isopropylbenzene	9.5	....	U
99-87-6	4-Isopropyltoluene	7.1	....	U

000156

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-19.0

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight

Lab Sample ID: 98-A69170
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	2.4	U
91-20-3	Naphthalene	2.4	U
103-65-1	n-Propylbenzene	2.4	U
100-42-5	Styrene	2.4	U
630-20-6	1,1,1,2-Tetrachloroethane	3.6	U
79-34-5	1,1,2,2-Tetrachloroethane	2.4	U
127-18-4	Tetrachloroethene	8.3	U
108-88-3	Toluene	6.0	U
87-61-6	1,2,3-Trichlorobenzene	2.4	U
120-82-1	1,2,4-Trichlorobenzene	2.4	U
71-55-6	1,1,1-Trichloroethane	4.8	U
79-00-5	1,1,2-Trichloroethane	6.0	U
79-01-6	Trichloroethene	11.9	U
96-18-4	1,2,3-Trichloropropane	23.8	U
95-63-6	1,2,4-Trimethylbenzene	8.3	U
108-67-8	1,3,5-Trimethylbenzene	3.6	U
75-01-4	Vinyl chloride	10.7	U
75-27-4	Bromodichloromethane	4.8	U
6615	o-Xylene	6.0	U
6616	m,p-Xylene	3.6	U
75-69-4	Trichlorofluoromethane	4.8	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-6.0

Matrix: Soil
% Dry Weight: 87.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69171
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/98
Analysis Time: 3:57
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	3.4	U
71-43-2	Benzene	11.5	U
108-86-1	Bromobenzene	11.5	U
124-48-1	Bromochloromethane	11.5	U
75-25-2	Bromoform	34.5	U
74-83-9	Bromomethane	28.7	U
104-51-8	n-Butylbenzene	28.7	U
135-98-8	sec-Butylbenzene	40.2	U
98-06-6	t-Butylbenzene	40.2	U
56-23-5	Carbon tetrachloride	57.5	U
108-90-7	Chlorobenzene	11.5	U
75-00-3	Chloroethane	28.7	U
67-66-3	Chloroform	11.5	U
74-87-3	Chloromethane	40.2	U
95-49-8	2-Chlorotoluene	11.5	U
106-43-4	4-Chlorotoluene	17.2	U
96-12-8	1,2-Dibromo-3-chloropropane	5.7	U
124-48-1	Dibromochloromethane	17.2	U
74-95-3	1,2-Dibromoethane	17.2	U
74-95-3	Dibromomethane	57.5	U
95-50-1	1,2-Dichlorobenzene	11.5	U
541-73-1	1,3-Dichlorobenzene	34.5	U
106-46-7	1,4-Dichlorobenzene	11.5	U
75-71-8	Dichlorodifluoromethane	28.7	U
75-34-3	1,1-Dichloroethane	11.5	U
107-06-2	1,2-Dichloroethane	17.2	U
75-35-4	1,1-Dichloroethene	34.5	U
156-59-2	cis-1,2-Dichloroethene	34.5	U
156-60-5	trans-1,2-Dichloroethene	17.2	U
78-87-5	1,2-Dichloropropane	11.5	U
142-28-9	1,3-Dichloropropane	11.5	U
594-20-7	2,2-Dichloropropane	115.	U
563-58-6	1,1-Dichloropropene	28.7	U
10061-01-5	cis-1,3-Dichloropropene	28.7	U
10061-02-6	trans-1,3-Dichloropropene	28.7	U
100-41-4	Ethylbenzene	17.2	U
87-68-3	Hexachlorobutadiene	28.7	U
98-82-8	Isopropylbenzene	46.0	U
99-87-6	4-Isopropyltoluene	34.5	U

000159

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-6.0

Matrix: Soil
% Dry Weight: 87.
Units: ug/kg dry weight

Lab Sample ID: 98-A69171
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	11.5	U
91-20-3	Naphthalene	11.5	U
103-65-1	n-Propylbenzene	11.5	U
100-42-5	Styrene	11.5	U
630-20-6	1,1,1,2-Tetrachloroethane	17.2	U
79-34-5	1,1,2,2-Tetrachloroethane	11.5	U
127-18-4	Tetrachloroethene	40.2	U
108-88-3	Toluene	28.7	U
87-61-6	1,2,3-Trichlorobenzene	11.5	U
120-82-1	1,2,4-Trichlorobenzene	11.5	U
71-55-6	1,1,1-Trichloroethane	23.0	U
79-00-5	1,1,2-Trichloroethane	28.7	U
79-01-6	Trichloroethene	57.5	U
96-18-4	1,2,3-Trichloropropane	115.	U
95-63-6	1,2,4-Trimethylbenzene	40.2	U
108-67-8	1,3,5-Trimethylbenzene	17.2	U
75-01-4	Vinyl chloride	51.7	U
75-27-4	Bromodichloromethane	23.0	U
6615	o-Xylene	28.7	U
6616	m,p-Xylene	17.2	U
75-69-4	Trichlorofluoromethane	23.0	U

000160

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-17.0

Matrix: Soil
% Dry Weight: 83.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69172
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/98
Analysis Time: 4:32
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	18.1	U
71-43-2	Benzene	12.0	U
108-86-1	Bromobenzene	12.0	U
124-48-1	Bromochloromethane	12.0	U
75-25-2	Bromoform	36.1	U
74-83-9	Bromomethane	30.1	U
104-51-8	n-Butylbenzene	30.1	U
135-98-8	sec-Butylbenzene	42.2	U
98-06-6	t-Butylbenzene	42.2	U
56-23-5	Carbon tetrachloride	60.2	U
108-90-7	Chlorobenzene	12.0	U
75-00-3	Chloroethane	30.1	U
67-66-3	Chloroform	12.0	U
74-87-3	Chloromethane	42.2	U
95-49-8	2-Chlorotoluene	12.0	U
106-43-4	4-Chlorotoluene	18.1	U
96-12-8	1,2-Dibromo-3-chloropropane	6.0	U
124-48-1	Dibromochloromethane	18.1	U
74-95-3	1,2-Dibromoethane	18.1	U
74-95-3	Dibromomethane	60.2	U
95-50-1	1,2-Dichlorobenzene	12.0	U
541-73-1	1,3-Dichlorobenzene	36.1	U
106-46-7	1,4-Dichlorobenzene	12.0	U
75-71-8	Dichlorodifluoromethane	30.1	U
75-34-3	1,1-Dichloroethane	12.0	U
107-06-2	1,2-Dichloroethane	18.1	U
75-35-4	1,1-Dichloroethene	36.1	U
156-59-2	cis-1,2-Dichloroethene	36.1	U
156-60-5	trans-1,2-Dichloroethene	18.1	U
78-87-5	1,2-Dichloropropane	12.0	U
142-28-9	1,3-Dichloropropane	12.0	U
594-20-7	2,2-Dichloropropane	120.	U
563-58-6	1,1-Dichloropropene	30.1	U
10061-01-5	cis-1,3-Dichloropropene	30.1	U
10061-02-6	trans-1,3-Dichloropropene	30.1	U
100-41-4	Ethylbenzene	18.1	U
87-68-3	Hexachlorobutadiene	30.1	U
98-82-8	Isopropylbenzene	66.3	
99-87-6	4-Isopropyltoluene	36.1	U

000163

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-17.0

Matrix: Soil
% Dry Weight: 83.
Units: ug/kg dry weight

Lab Sample ID: 98-A69172
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	12.0	U
91-20-3	Naphthalene	12.0	U
103-65-1	n-Propylbenzene	12.0	U
100-42-5	Styrene	12.0	U
630-20-6	1,1,1,2-Tetrachloroethane	18.1	U
79-34-5	1,1,2,2-Tetrachloroethane	12.0	U
127-18-4	Tetrachloroethene	42.2	U
108-88-3	Toluene	30.1	U
87-61-6	1,2,3-Trichlorobenzene	12.0	U
120-82-1	1,2,4-Trichlorobenzene	12.0	U
71-55-6	1,1,1-Trichloroethane	24.1	U
79-00-5	1,1,2-Trichloroethane	30.1	U
79-01-6	Trichloroethene	60.2	U
96-18-4	1,2,3-Trichloropropane	120.	U
95-63-6	1,2,4-Trimethylbenzene	42.2	U
108-67-8	1,3,5-Trimethylbenzene	18.1	U
75-01-4	Vinyl chloride	54.2	U
75-27-4	Bromodichloromethane	24.1	U
6615	o-Xylene	30.1	U
6616	m,p-Xylene	18.1	U
75-69-4	Trichlorofluoromethane	24.1	U

000164

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B9-15.0

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69173
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/98
Analysis Time: 5:08
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	3.9	U
71-43-2	Benzene	2.6	U
108-86-1	Bromobenzene	2.6	U
124-48-1	Bromochloromethane	2.6	U
75-25-2	Bromoform	7.8	U
74-83-9	Bromomethane	6.5	U
104-51-8	n-Butylbenzene	6.5	U
135-98-8	sec-Butylbenzene	9.1	U
98-06-6	t-Butylbenzene	9.1	U
56-23-5	Carbon tetrachloride	13.0	U
108-90-7	Chlorobenzene	2.6	U
75-00-3	Chloroethane	6.5	U
67-66-3	Chloroform	2.6	U
74-87-3	Chloromethane	9.1	U
95-49-8	2-Chlorotoluene	2.6	U
106-43-4	4-Chlorotoluene	3.9	U
96-12-8	1,2-Dibromo-3-chloropropane	1.3	U
124-48-1	Dibromochloromethane	3.9	U
74-95-3	1,2-Dibromoethane	3.9	U
74-95-3	Dibromomethane	13.0	U
95-50-1	1,2-Dichlorobenzene	2.6	U
541-73-1	1,3-Dichlorobenzene	7.8	U
106-46-7	1,4-Dichlorobenzene	2.6	U
75-71-8	Dichlorodifluoromethane	6.5	U
75-34-3	1,1-Dichloroethane	2.6	U
107-06-2	1,2-Dichloroethane	3.9	U
75-35-4	1,1-Dichloroethene	7.8	U
156-59-2	cis-1,2-Dichloroethene	7.8	U
156-60-5	trans-1,2-Dichloroethene	3.9	U
78-87-5	1,2-Dichloropropane	2.6	U
142-28-9	1,3-Dichloropropane	2.6	U
594-20-7	2,2-Dichloropropane	26.0	U
563-58-6	1,1-Dichloropropene	6.5	U
10061-01-5	cis-1,3-Dichloropropene	6.5	U
10061-02-6	trans-1,3-Dichloropropene	6.5	U
100-41-4	Ethylbenzene	3.9	U
87-68-3	Hexachlorobutadiene	6.5	U
98-82-8	Isopropylbenzene	10.4	U
99-87-6	4-Isopropyltoluene	7.8	U

000168

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B9-15.0

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight

Lab Sample ID: 98-A69173
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	2.6	U
91-20-3	Naphthalene	2.6	U
103-65-1	n-Propylbenzene	2.6	U
100-42-5	Styrene	2.6	U
630-20-6	1,1,1,2-Tetrachloroethane	3.9	U
79-34-5	1,1,2,2-Tetrachloroethane	2.6	U
127-18-4	Tetrachloroethene	9.1	U
108-88-3	Toluene	6.5	U
87-61-6	1,2,3-Trichlorobenzene	2.6	U
120-82-1	1,2,4-Trichlorobenzene	2.6	U
71-55-6	1,1,1-Trichloroethane	5.2	U
79-00-5	1,1,2-Trichloroethane	6.5	U
79-01-6	Trichloroethene	13.0	U
96-18-4	1,2,3-Trichloropropane	26.0	U
95-63-6	1,2,4-Trimethylbenzene	9.1	U
108-67-8	1,3,5-Trimethylbenzene	3.9	U
75-01-4	Vinyl chloride	11.7	U
75-27-4	Bromodichloromethane	5.2	U
6615	o-Xylene	6.5	U
6616	m,p-Xylene	3.9	U
75-69-4	Trichlorofluoromethane	5.2	U

000169

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B10-15.5

Matrix: Soil
% Dry Weight: 85.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69174
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/98
Analysis Time: 5:44
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	17.6	U
71-43-2	Benzene	11.8	U
108-86-1	Bromobenzene	11.8	U
124-48-1	Bromochloromethane	11.8	U
75-25-2	Bromoform	35.3	U
74-83-9	Bromomethane	29.4	U
104-51-8	n-Butylbenzene	29.4	U
135-98-8	sec-Butylbenzene	41.2	U
98-06-6	t-Butylbenzene	41.2	U
56-23-5	Carbon tetrachloride	58.8	U
108-90-7	Chlorobenzene	11.8	U
75-00-3	Chloroethane	29.4	U
67-66-3	Chloroform	11.8	U
74-87-3	Chloromethane	41.2	U
95-49-8	2-Chlorotoluene	11.8	U
106-43-4	4-Chlorotoluene	17.6	U
96-12-8	1,2-Dibromo-3-chloropropane	5.9	U
124-48-1	Dibromochloromethane	17.6	U
74-95-3	1,2-Dibromoethane	17.6	U
74-95-3	Dibromomethane	58.8	U
95-50-1	1,2-Dichlorobenzene	11.8	U
541-73-1	1,3-Dichlorobenzene	35.3	U
106-46-7	1,4-Dichlorobenzene	11.8	U
75-71-8	Dichlorodifluoromethane	29.4	U
75-34-3	1,1-Dichloroethane	11.8	U
107-06-2	1,2-Dichloroethane	17.6	U
75-35-4	1,1-Dichloroethene	35.3	U
156-59-2	cis-1,2-Dichloroethene	35.3	U
156-60-5	trans-1,2-Dichloroethene	17.6	U
78-87-5	1,2-Dichloropropane	11.8	U
142-28-9	1,3-Dichloropropane	11.8	U
594-20-7	2,2-Dichloropropane	118.	U
563-58-6	1,1-Dichloropropene	29.4	U
10061-01-5	cis-1,3-Dichloropropene	29.4	U
10061-02-6	trans-1,3-Dichloropropene	29.4	U
100-41-4	Ethylbenzene	17.6	U
87-68-3	Hexachlorobutadiene	29.4	U
98-82-8	Isopropylbenzene	47.1	U
99-87-6	4-Isopropyltoluene	52.9	

000172

COPY 1

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B10-15.5

Matrix: Soil
% Dry Weight: 85.
Units: ug/kg dry weight

Lab Sample ID: 98-A69174
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	11.8	U
91-20-3	Naphthalene	11.8	U
103-65-1	n-Propylbenzene	11.8	U
100-42-5	Styrene	11.8	U
630-20-6	1,1,1,2-Tetrachloroethane	17.6	U
79-34-5	1,1,2,2-Tetrachloroethane	11.8	U
127-18-4	Tetrachloroethene	41.2	U
108-88-3	Toluene	29.4	U
87-61-6	1,2,3-Trichlorobenzene	11.8	U
120-82-1	1,2,4-Trichlorobenzene	11.8	U
71-55-6	1,1,1-Trichloroethane	23.5	U
79-00-5	1,1,2-Trichloroethane	29.4	U
79-01-6	Trichloroethene	58.8	U
96-18-4	1,2,3-Trichloropropane	118.	U
95-63-6	1,2,4-Trimethylbenzene	41.2	U
108-67-8	1,3,5-Trimethylbenzene	17.6	U
75-01-4	Vinyl chloride	52.9	U
75-27-4	Bromodichloromethane	23.5	U
6615	o-Xylene	29.4	U
6616	m,p-Xylene	17.6	U
75-69-4	Trichlorofluoromethane	23.5	U

000173

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-E

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69175
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/19/98
Analysis Time: 9:00
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
144-10-5	1-Chlorohexane	17.9	....	U
71-43-2	Benzene	11.9	....	U
108-86-1	Bromobenzene	11.9	....	U
124-48-1	Bromochloromethane	11.9	....	U
75-25-2	Bromoform	35.7	....	U
74-83-9	Bromomethane	29.8	....	U
104-51-8	n-Butylbenzene	29.8	....	U
135-98-8	sec-Butylbenzene	41.7	....	U
98-06-6	t-Butylbenzene	41.7	....	U
56-23-5	Carbon tetrachloride	59.5	....	U
108-90-7	Chlorobenzene	11.9	....	U
75-00-3	Chloroethane	29.8	....	U
67-66-3	Chloroform	11.9	....	U
74-87-3	Chloromethane	41.7	....	U
95-49-8	2-Chlorotoluene	11.9	....	U
106-43-4	4-Chlorotoluene	17.9	....	U
96-12-8	1,2-Dibromo-3-chloropropane	6.0	....	U
124-48-1	Dibromochloromethane	17.9	....	U
74-95-3	1,2-Dibromoethane	17.9	....	U
74-95-3	Dibromomethane	59.5	....	U
95-50-1	1,2-Dichlorobenzene	11.9	....	U
541-73-1	1,3-Dichlorobenzene	35.7	....	U
106-46-7	1,4-Dichlorobenzene	11.9	....	U
75-71-8	Dichlorodifluoromethane	29.8	....	U
75-34-3	1,1-Dichloroethane	11.9	....	U
107-06-2	1,2-Dichloroethane	17.9	....	U
75-35-4	1,1-Dichloroethene	35.7	....	U
156-59-2	cis-1,2-Dichloroethene	35.7	....	U
156-60-5	trans-1,2-Dichloroethene	17.9	....	U
78-87-5	1,2-Dichloropropane	11.9	....	U
142-28-9	1,3-Dichloropropane	11.9	....	U
594-20-7	2,2-Dichloropropane	119.	....	U
563-58-6	1,1-Dichloropropene	29.8	....	U
10061-01-5	cis-1,3-Dichloropropene	29.8	....	U
10061-02-6	trans-1,3-Dichloropropene	29.8	....	U
100-41-4	Ethylbenzene	17.9	....	U
87-68-3	Hexachlorobutadiene	29.8	....	U
98-82-8	Isopropylbenzene	47.6	....	U
99-87-6	4-Isopropyltoluene	35.7	....	U

000177

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-E

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight

Lab Sample ID: 98-A69175
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	11.9	U
91-20-3	Naphthalene	11.9	U
103-65-1	n-Propylbenzene	11.9	U
100-42-5	Styrene	11.9	U
630-20-6	1,1,1,2-Tetrachloroethane	17.9	U
79-34-5	1,1,2,2-Tetrachloroethane	11.9	U
127-18-4	Tetrachloroethene	41.7	U
108-88-3	Toluene	29.8	U
87-61-6	1,2,3-Trichlorobenzene	11.9	U
120-82-1	1,2,4-Trichlorobenzene	11.9	U
71-55-6	1,1,1-Trichloroethane	23.8	U
79-00-5	1,1,2-Trichloroethane	29.8	U
79-01-6	Trichloroethene	59.5	U
96-18-4	1,2,3-Trichloropropane	119.	U
95-63-6	1,2,4-Trimethylbenzene	41.7	U
108-67-8	1,3,5-Trimethylbenzene	17.9	U
75-01-4	Vinyl chloride	53.6	U
75-27-4	Bromodichloromethane	23.8	U
6615	o-Xylene	29.8	U
6616	m,p-Xylene	17.9	U
75-69-4	Trichlorofluoromethane	23.8	U

000178

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B11-18.5

Matrix: Soil
% Dry Weight: 89.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69176
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/18/96
Analysis Time: 6:55
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	3.4	U
71-43-2	Benzene	2.2	U
108-86-1	Bromobenzene	2.2	U
124-48-1	Bromochloromethane	2.2	U
75-25-2	Bromoform	6.7	U
74-83-9	Bromomethane	5.6	U
104-51-8	n-Butylbenzene	5.6	U
135-98-8	sec-Butylbenzene	7.9	U
98-06-6	t-Butylbenzene	7.9	U
56-23-5	Carbon tetrachloride	11.2	U
108-90-7	Chlorobenzene	9.0	
75-00-3	Chloroethane	5.6	U
67-66-3	Chloroform	2.2	U
74-87-3	Chloromethane	7.9	U
95-49-8	2-Chlorotoluene	2.2	U
106-43-4	4-Chlorotoluene	3.4	U
96-12-8	1,2-Dibromo-3-chloropropane	1.1	U
124-48-1	Dibromochloromethane	3.4	U
74-95-3	1,2-Dibromoethane	3.4	U
74-95-3	Dibromomethane	11.2	U
95-50-1	1,2-Dichlorobenzene	2.2	U
541-73-1	1,3-Dichlorobenzene	6.7	U
106-46-7	1,4-Dichlorobenzene	2.2	U
75-71-8	Dichlorodifluoromethane	5.6	U
75-34-3	1,1-Dichloroethane	2.2	U
107-06-2	1,2-Dichloroethane	3.4	U
75-35-4	1,1-Dichloroethene	6.7	U
156-59-2	cis-1,2-Dichloroethene	6.7	U
156-60-5	trans-1,2-Dichloroethene	3.4	U
78-87-5	1,2-Dichloropropane	2.2	U
142-28-9	1,3-Dichloropropane	2.2	U
594-20-7	2,2-Dichloropropane	22.5	U
563-58-6	1,1-Dichloropropene	5.6	U
10061-01-5	cis-1,3-Dichloropropene	5.6	U
10061-02-6	trans-1,3-Dichloropropene	5.6	U
100-41-4	Ethylbenzene	5.6	
87-68-3	Hexachlorobutadiene	5.6	U
98-82-8	Isopropylbenzene	9.0	U
99-87-6	4-Isopropyltoluene	6.7	U

000181

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B11-18.5

Matrix: Soil
% Dry Weight: 89.
Units: ug/kg dry weight

Lab Sample ID: 98-A69176
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	2.2	U
91-20-3	Naphthalene	11.2	
103-65-1	n-Propylbenzene	2.2	U
100-42-5	Styrene	2.2	U
630-20-6	1,1,1,2-Tetrachloroethane	3.4	U
79-34-5	1,1,2,2-Tetrachloroethane	2.2	U
127-18-4	Tetrachloroethene	7.9	U
108-88-3	Toluene	23.6	
87-61-6	1,2,3-Trichlorobenzene	2.2	U
120-82-1	1,2,4-Trichlorobenzene	2.2	U
71-55-6	1,1,1-Trichloroethane	4.5	U
79-00-5	1,1,2-Trichloroethane	5.6	U
79-01-6	Trichloroethene	11.2	U
96-18-4	1,2,3-Trichloropropane	22.5	U
95-63-6	1,2,4-Trimethylbenzene	3.4	J
108-67-8	1,3,5-Trimethylbenzene	3.4	U
75-01-4	Vinyl chloride	10.1	U
75-27-4	Bromodichloromethane	4.5	U
6615	o-Xylene	5.6	U
6616	m,p-Xylene	3.4	U
75-69-4	Trichlorofluoromethane	4.5	U

000182

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B11-18.5

Matrix: Soil
% Dry Weight: 89.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: 98-A69176
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/30/98
Analysis Time: 20:59
Sample QC Group: 6741

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
144-10-5	1-Chlorohexane	16.9	U
71-43-2	Benzene	11.2	U
108-86-1	Bromobenzene	11.2	U
124-48-1	Bromochloromethane	11.2	U
75-25-2	Bromoform	33.7	U
74-83-9	Bromomethane	28.1	U
104-51-8	n-Butylbenzene	28.1	U
135-98-8	sec-Butylbenzene	39.3	U
98-06-6	t-Butylbenzene	39.3	U
56-23-5	Carbon tetrachloride	56.2	U
108-90-7	Chlorobenzene	11.2	U
75-00-3	Chloroethane	28.1	U
67-66-3	Chloroform	11.2	U
74-87-3	Chloromethane	39.3	U
95-49-8	2-Chlorotoluene	11.2	U
106-43-4	4-Chlorotoluene	16.9	U
96-12-8	1,2-Dibromo-3-chloropropane	5.6	U
124-48-1	Dibromochloromethane	16.9	U
74-95-3	1,2-Dibromoethane	16.9	U
74-95-3	Dibromomethane	56.2	U
95-50-1	1,2-Dichlorobenzene	11.2	U
541-73-1	1,3-Dichlorobenzene	33.7	U
106-46-7	1,4-Dichlorobenzene	11.2	U
75-71-8	Dichlorodifluoromethane	28.1	U
75-34-3	1,1-Dichloroethane	11.2	U
107-06-2	1,2-Dichloroethane	16.9	U
75-35-4	1,1-Dichloroethene	33.7	U
156-59-2	cis-1,2-Dichloroethene	33.7	U
156-60-5	trans-1,2-Dichloroethene	16.9	U
78-87-5	1,2-Dichloropropane	11.2	U
142-28-9	1,3-Dichloropropane	11.2	U
594-20-7	2,2-Dichloropropane	112.	U
563-58-6	1,1-Dichloropropene	28.1	U
10061-01-5	cis-1,3-Dichloropropene	28.1	U
10061-02-6	trans-1,3-Dichloropropene	28.1	U
100-41-4	Ethylbenzene	16.9	U
87-68-3	Hexachlorobutadiene	28.1	U
98-82-8	Isopropylbenzene	44.9	U
99-87-6	4-Isopropyltoluene	33.7	U

000188

COPY 1

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B11-18.5

Matrix: Soil
% Dry Weight: 89.
Units: ug/kg dry weight

Lab Sample ID: 98-A69176
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
75-09-2	Methylene chloride	11.2	U
91-20-3	Naphthalene	11.2	U
103-65-1	n-Propylbenzene	11.2	U
100-42-5	Styrene	11.2	U
630-20-6	1,1,1,2-Tetrachloroethane	16.9	U
79-34-5	1,1,2,2-Tetrachloroethane	11.2	U
127-18-4	Tetrachloroethene	39.3	U
108-88-3	Toluene	28.1	U
87-61-6	1,2,3-Trichlorobenzene	11.2	U
120-82-1	1,2,4-Trichlorobenzene	11.2	U
71-55-6	1,1,1-Trichloroethane	22.5	U
79-00-5	1,1,2-Trichloroethane	28.1	U
79-01-6	Trichloroethene	56.2	U
96-18-4	1,2,3-Trichloropropane	112.	U
95-63-6	1,2,4-Trimethylbenzene	39.3	U
108-67-8	1,3,5-Trimethylbenzene	16.9	U
75-01-4	Vinyl chloride	50.6	U
75-27-4	Bromodichloromethane	22.5	U
6615	o-Xylene	28.1	U
6616	m,p-Xylene	16.9	U
75-69-4	Trichlorofluoromethane	22.5	U

000189

COPY 1

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG
Dilution Factor: 1
Analysis Method: SW8260B
Delivery Group: 103948
Instrument: HP-1

Lab Sample ID: BLANK
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/17/98
Analysis Time: 10:37
Sample QC Group: ~~4067~~ 674

6-4-98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
71-43-2	Benzene	2.0	....	U
108-86-1	Bromobenzene	2.0	....	U
124-48-1	Bromochloromethane	2.0	....	U
75-25-2	Bromoform	6.0	....	U
74-83-9	Bromomethane	5.0	....	U
104-51-8	n-Butylbenzene	5.0	....	U
135-98-8	sec-Butylbenzene	7.0	....	U
98-06-6	t-Butylbenzene	7.0	....	U
56-23-5	Carbon tetrachloride	10.0	....	U
108-90-7	Chlorobenzene	2.0	....	U
75-00-3	Chloroethane	5.0	....	U
67-66-3	Chloroform	2.0	....	U
74-87-3	Chloromethane	7.0	....	U
95-49-8	2-Chlorotoluene	2.0	....	U
106-43-4	4-Chlorotoluene	3.0	....	U
96-12-8	1,2-Dibromo-3-chloropropane	1.0	....	U
124-48-1	Dibromochloromethane	3.0	....	U
74-95-3	1,2-Dibromoethane	3.0	....	U
74-95-3	Dibromomethane	10.0	....	U
95-50-1	1,2-Dichlorobenzene	2.0	....	U
541-73-1	1,3-Dichlorobenzene	6.0	....	U
106-46-7	1,4-Dichlorobenzene	2.0	....	U
75-71-8	Dichlorodifluoromethane	5.0	....	U
75-34-3	1,1-Dichloroethane	2.0	....	U
107-06-2	1,2-Dichloroethane	3.0	....	U
75-35-4	1,1-Dichloroethene	6.0	....	U
156-59-2	cis-1,2-Dichloroethene	6.0	....	U
156-60-5	trans-1,2-Dichloroethene	3.0	....	U
78-87-5	1,2-Dichloropropane	2.0	....	U
142-28-9	1,3-Dichloropropane	2.0	....	U
594-20-7	2,2-Dichloropropane	20.0	....	U
563-58-6	1,1-Dichloropropene	5.0	....	U
10061-01-5	cis-1,3-Dichloropropene	5.0	....	U
10061-02-6	trans-1,3-Dichloropropene	5.0	....	U
100-41-4	Ethylbenzene	3.0	....	U
87-68-3	Hexachlorobutadiene	5.0	....	U

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG

Lab Sample ID: BLANK
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
98-82-8	Isopropylbenzene	8.0	....	U
99-87-6	4-Isopropyltoluene	6.0	....	U
75-09-2	Methylene chloride	2.0	....	U
91-20-3	Naphthalene	2.0	....	U
103-65-1	n-Propylbenzene	2.0	....	U
100-42-5	Styrene	2.0	....	U
630-20-6	1,1,1,2-Tetrachloroethane	3.0	....	U
79-34-5	1,1,2,2-Tetrachloroethane	2.0	....	U
127-18-4	Tetrachloroethene	7.0	....	U
108-88-3	Toluene	5.0	....	U
87-61-6	1,2,3-Trichlorobenzene	2.0	....	U
120-82-1	1,2,4-Trichlorobenzene	2.0	....	U
71-55-6	1,1,1-Trichloroethane	4.0	....	U
79-00-5	1,1,2-Trichloroethane	5.0	....	U
79-01-6	Trichloroethene	10.0	....	U
96-18-4	1,2,3-Trichloropropane	20.0	....	U
95-63-6	1,2,4-Trimethylbenzene	7.0	....	U
108-67-8	1,3,5-Trimethylbenzene	3.0	....	U
75-01-4	Vinyl chloride	9.0	....	U
75-27-4	Bromodichloromethane	4.0	....	U
6615	o-Xylene	5.0	....	U
6616	m,p-Xylene	3.0	....	U
75-69-4	Trichlorofluoromethane	4.0	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

EQUIP. BLANK 2

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Vol Extracted: 980. ml
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69160
Date Sampled:: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/19/98
Analysis Time: 16:02
Sample QC Group: 6324

Extraction Date: 6/18/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	10.2	U
208-96-8	Acenaphthylene	10.2	U
120-12-7	Anthracene	10.2	U
65-85-0	Benzoic Acid	51	U
56-55-3	Benzo(a)anthracene	10.2	U
50-32-8	Benzo(a)pyrene	10.2	U
205-99-2	Benzo(b)fluoranthene	10.2	U
191-24-2	Benzo(g,h,i)perylene	10.2	U
101-55-3	4-Bromophenyl-phenylether	10.2	U
85-68-7	Butylbenzylphthalate	10.2	U
59-50-7	4-Chloro-3-methylphenol	20.4	U
106-47-8	4-Chloroaniline	20.4	U
111-91-1	Bis(2-chloroethoxy)methane	10.2	U
111-44-4	Bis(2-chloroethyl)ether	10.2	U
108-60-1	Bis(2-chloroisopropyl)ether	10.2	U
91-58-7	2-Chloronaphthalene	10.2	U
95-57-8	2-Chlorophenol	10.2	U
7005-72-3	4-Chlorophenyl-phenylether	10.2	U
218-01-9	Chrysene	10.2	U
132-64-9	Dibenzofuran	10.2	U
53-70-3	Dibenz(a,h)anthracene	10.2	U
95-50-1	1,2-Dichlorobenzene	10.2	U
541-73-1	1,3-Dichlorobenzene	10.2	U
106-46-7	1,4-Dichlorobenzene	10.2	U
91-94-1	3,3'-Dichlorobenzidine	20.4	U
120-83-2	2,4-Dichlorophenol	10.2	U
84-66-2	Diethylphthalate	10.2	U
105-67-9	2,4-Dimethylphenol	10.2	U
131-11-3	Dimethylphthalate	10.2	U
84-74-2	Di-n-Butylphthalate	10.2	U
534-52-1	4,6-Dinitro-2-methylphenol	51	U
51-28-5	2,4-Dinitrophenol	51	U
121-14-2	2,4-dinitrotoluene	10.2	U
606-20-2	2,6-Dinitrotoluene	10.2	U
117-84-0	Di-n-octylphthalate	10.2	U
206-44-0	Fluoranthene	10.2	U
86-73-7	Fluorene	10.2	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

EQUIP. BLANK 2

Matrix: Water
pH:
Units: ug/l

Lab Sample ID: 98-A69160
Date Sampled:: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	10.2	U
87-68-3	Hexachlorobutadiene	10.2	U
77-47-4	Hexachlorocyclopentadiene	10.2	U
67-72-1	Hexachloroethane	10.2	U
193-39-5	Indeno(1,2,3-cd)pyrene	10.2	U
78-59-1	Isophorone	10.2	U
91-57-6	2-Methylnaphthalene	10.2	U
95-48-7	2-Methylphenol	10.2	U
106-44-5	3. and 4-Methylphenol	10.2	U
91-20-3	Naphthalene	10.2	U
88-74-4	2-Nitroaniline	51	U
99-09-2	3-Nitroaniline	51	U
100-01-6	4-Nitroaniline	51	U
98-95-3	Nitrobenzene	10.2	U
88-75-5	2-Nitrophenol	10.2	U
100-02-7	4-Nitrophenol	51	U
621-64-7	N-Nitroso-Di-n-Propylamine	10.2	U
86-30-6	N-Nitrosodiphenylamine	10.2	U
87-86-5	Pentachlorophenol	51	U
85-01-8	Phenanthrene	10.2	U
108-95-2	Phenol	10.2	U
129-00-0	Pyrene	10.2	U
117-81-7	Bis(2-ethylhexyl)phthalate	10.2	U
120-82-1	1,2,4-Trichlorobenzene	10.2	U
95-95-4	2,4,5-Trichlorophenol	51	U
88-06-2	2,4,6-Trichlorophenol	10.2	U
NA	Benzyl alcohol	20.4	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L
Dilution Factor: 1
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Vol Extracted: 1000 ml
Extract Vol: 1.0 ml

Lab Sample ID: BLANK
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/19/98
Analysis Time: 13:36
Sample QC Group: 6324

Extraction Date: 6/18/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
83-32-9	Acenaphthene	10.0	....	U
208-96-8	Acenaphthylene	10.0	....	U
120-12-7	Anthracene	10.0	....	U
65-85-0	Benzoic Acid	50.0	....	U
56-55-3	Benzo(a)anthracene	10.0	....	U
50-32-8	Benzo(a)pyrene	10.0	....	U
205-99-2	Benzo(b)fluoranthene	10.0	....	U
191-24-2	Benzo(g,h,i)perylene	10.0	....	U
101-55-3	4-Bromophenyl-phenylether	10.0	....	U
85-68-7	Butylbenzylphthalate	10.0	....	U
59-50-7	4-Chloro-3-methylphenol	20.0	....	U
106-47-8	4-Chloroaniline	20.0	....	U
111-91-1	Bis(2-chloroethoxy)methane	10.0	....	U
111-44-4	Bis(2-chloroethyl)ether	10.0	....	U
108-60-1	Bis(2-chloroisopropyl)ether	10.0	....	U
91-58-7	2-Chloronaphthalene	10.0	....	U
95-57-8	2-Chlorophenol	10.0	....	U
7005-72-3	4-Chlorophenyl-phenylether	10.0	....	U
218-01-9	Chrysene	10.0	....	U
132-64-9	Dibenzofuran	10.0	....	U
53-70-3	Dibenz(a,h)anthracene	10.0	....	U
95-50-1	1,2-Dichlorobenzene	10.0	....	U
541-73-1	1,3-Dichlorobenzene	10.0	....	U
106-46-7	1,4-Dichlorobenzene	10.0	....	U
91-94-1	3,3'-Dichlorobenzidine	20.0	....	U
120-83-2	2,4-Dichlorophenol	10.0	....	U
84-66-2	Diethylphthalate	10.0	....	U
105-67-9	2,4-Dimethylphenol	10.0	....	U
131-11-3	Dimethylphthalate	10.0	....	U
84-74-2	Di-n-Butylphthalate	10.0	....	U
534-52-1	4,6-Dinitro-2-methylphenol	50.0	....	U
51-28-5	2,4-Dinitrophenol	50.0	....	U
121-14-2	2,4-dinitrotoluene	10.0	....	U
606-20-2	2,6-Dinitrotoluene	10.0	....	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L

Lab Sample ID: BLANK
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
117-84-0	Di-n-octylphthalate	10.0	....	U
206-44-0	Fluoranthene	10.0	....	U
86-73-7	Fluorene	10.0	....	U
118-74-1	Hexachlorobenzene	10.0	....	U
87-68-3	Hexachlorobutadiene	10.0	....	U
77-47-4	Hexachlorocyclopentadiene	10.0	....	U
67-72-1	Hexachloroethane	10.0	....	U
193-39-5	Indeno(1,2,3-cd)pyrene	10.0	....	U
78-59-1	Isophorone	10.0	....	U
91-57-6	2-Methylnaphthalene	10.0	....	U
95-48-7	2-Methylphenol	10.0	....	U
106-44-5	3.and 4-Methylphenol	10.0	....	U
91-20-3	Naphthalene	10.0	....	U
88-74-4	2-Nitroaniline	50.0	....	U
99-09-2	3-Nitroaniline	50.0	....	U
100-01-6	4-Nitroaniline	50.0	....	U
98-95-3	Nitrobenzene	10.0	....	U
88-75-5	2-Nitrophenol	10.0	....	U
100-02-7	4-Nitrophenol	50.0	....	U
621-64-7	N-Nitroso-Di-n-Propylamine	10.0	....	U
86-30-6	N-Nitrosodiphenylamine	10.0	....	U
87-86-5	Pentachlorophenol	50.0	....	U
85-01-8	Phenanthrene	10.0	....	U
108-95-2	Phenol	10.0	....	U
129-00-0	Pyrene	10.0	....	U
117-81-7	Bis(2-ethylhexyl)phthalate	10.0	....	U
120-82-1	1,2,4-Trichlorobenzene	10.0	....	U
95-95-4	2,4,5-Trichlorophenol	50.0	....	U
88-06-2	2,4,6-Trichlorophenol	10.0	....	U
NA	Benzyl alcohol	20.0	....	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-3.0

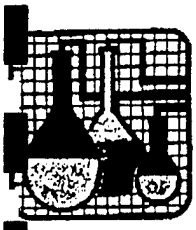
Matrix: Soil
% Dry Weight: 92.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69166
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/28/98
Analysis Time: 17:22
Sample QC Group: 3387

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	725	J
208-96-8	Acenaphthylene	3800	U
120-12-7	Anthracene	3800	U
65-85-0	Benzoic Acid	8700	U
56-55-3	Benzo(a)anthracene	3800	U
50-32-8	Benzo(a)pyrene	3800	U
205-99-2	Benzo(b)fluoranthene	3800	U
191-24-2	Benzo(g,h,i)perylene	3800	U
101-55-3	4-Bromophenylphenylether	3800	U
85-68-7	Butylbenzylphthalate	3800	U
59-50-7	4-Chloro-3-methylphenol	7070	U
106-47-8	4-Chloroaniline	7070	U
111-91-1	bis(2-Chloroethoxy)methane	3800	U
111-44-4	bis(2-Chloroethyl)ether	3800	U
108-60-1	bis(2-Chloroisopropyl)ether	3800	U
91-58-7	2-Chloronaphthalene	3800	U
95-57-8	2-Chlorophenol	3800	U
7005-72-3	4-Chlorophenylphenylether	3800	U
218-01-9	Chrysene	3800	U
132-64-9	Dibenzofuran	543	J
53-70-3	Dibenz(a,h)anthracene	3800	U
95-50-1	1,2-Dichlorobenzene	3800	U
541-73-1	1,3-Dichlorobenzene	3800	U
106-46-7	1,4-Dichlorobenzene	3800	U
91-94-1	3,3'-Dichlorobenzidine	7070	U
120-83-2	2,4-Dichlorophenol	1630	U
84-66-2	Diethylphthalate	3800	U
105-67-9	2,4-Dimethylphenol	1630	U
131-11-3	Dimethylphthalate	3800	U
84-74-2	Di-n-butylphthalate	3800	U
534-52-1	4,6-Dinitro-2-methylphenol	17900	U
51-28-5	2,4-Dinitrophenol	17900	U
121-14-2	2,4-dinitrotoluene	3800	U
606-20-2	2,6-Dinitrotoluene	3800	U
117-84-0	Di-n-octylphthalate	3800	U
206-44-0	Fluoranthene	362	J
86-73-7	Fluorene	543	J



SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-3.0

Matrix: Soil
% Dry Weight: 92.
Units: ug/kg dry weight

Lab Sample ID: 98-A69166
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	3800	U
87-68-3	Hexachlorobutadiene	3800	U
77-47-4	Hexachlorocyclopentadiene	3800	U
67-72-1	Hexachloroethane	3800	U
193-39-5	Indeno(1,2,3-cd)pyrene	3800	U
78-59-1	Isophorone	3800	U
91-57-6	2-Methylnaphthalene	2170	J
95-48-7	2-Methylphenol	1630	U
106-44-5	m,p-Methylphenol	1630	U
91-20-3	Naphthalene	543	J
88-74-4	2-Nitroaniline	17900	U
99-09-2	3-Nitroaniline	17900	U
100-01-6	4-Nitroaniline	17900	U
98-95-3	Nitrobenzene	3800	U
88-75-5	2-Nitrophenol	1630	U
100-02-7	4-Nitrophenol	8700	U
621-64-7	N-nitrosodi-n-propylamine	3800	U
86-30-6	N-nitrosodiphenylamine	3800	U
87-86-5	Pentachlorophenol	17900	U
85-01-8	Phenanthrene	3800	U
108-95-2	Phenol	1630	U
129-00-0	Pyrene	543	J
117-81-7	Bis(2-ethylhexyl)phthalate	2530	J
120-82-1	1,2,4-Trichlorobenzene	3800	U
95-95-4	2,4,5-Trichlorophenol	17900	U
88-06-2	2,4,6-Trichlorophenol	1630	U
NA	Benzyl Alcohol	7070	U

000444

COPY

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-19.0

Matrix: Soil
% Dry Weight: 96.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69167
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/26/98
Analysis Time: 19:03
Sample QC Group: 6409

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	729	U
208-96-8	Acenaphthylene	729	U
120-12-7	Anthracene	729	U
65-85-0	Benzoic Acid	1670	U
56-55-3	Benzo(a)anthracene	729	U
50-32-8	Benzo(a)pyrene	729	U
205-99-2	Benzo(b)fluoranthene	729	U
191-24-2	Benzo(g,h,i)perylene	729	U
101-55-3	4-Bromophenylphenylether	729	U
85-68-7	Butylbenzylphthalate	729	U
59-50-7	4-Chloro-3-methylphenol	1350	U
106-47-8	4-Chloroaniline	1350	U
111-91-1	bis(2-Chloroethoxy)methane	729	U
111-44-4	bis(2-Chloroethyl)ether	729	U
108-60-1	bis(2-Chloroisopropyl)ether	729	U
91-58-7	2-Chloronaphthalene	729	U
95-57-8	2-Chlorophenol	729	U
7005-72-3	4-Chlorophenylphenylether	729	U
218-01-9	Chrysene	729	U
132-64-9	Dibenzofuran	729	U
53-70-3	Dibenz(a,h)anthracene	729	U
95-50-1	1,2-Dichlorobenzene	729	U
541-73-1	1,3-Dichlorobenzene	729	U
106-46-7	1,4-Dichlorobenzene	729	U
91-94-1	3,3'-Dichlorobenzidine	1350	U
120-83-2	2,4-Dichlorophenol	312	U
84-66-2	Diethylphthalate	729	U
105-67-9	2,4-Dimethylphenol	312	U
131-11-3	Dimethylphthalate	729	U
84-74-2	Di-n-butylphthalate	729	U
534-52-1	4,6-Dinitro-2-methylphenol	3440	U
51-28-5	2,4-Dinitrophenol	3440	U
121-14-2	2,4-dinitrotoluene	729	U
606-20-2	2,6-Dinitrotoluene	729	U
117-84-0	Di-n-octylphthalate	729	U
206-44-0	Fluoranthene	729	U
86-73-7	Fluorene	729	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-19.0

Matrix: Soil
% Dry Weight: 96.
Units: ug/kg dry weight

Lab Sample ID: 98-A69167
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	729	U
87-68-3	Hexachlorobutadiene	729	U
77-47-4	Hexachlorocyclopentadiene	729	U
67-72-1	Hexachloroethane	729	U
193-39-5	Indeno(1,2,3-cd)pyrene	729	U
78-59-1	Isophorone	729	U
91-57-6	2-Methylnaphthalene	729	U
95-48-7	2-Methylphenol	312	U
106-44-5	m,p-Methylphenol	312	U
91-20-3	Naphthalene	729	U
88-74-4	2-Nitroaniline	3440	U
99-09-2	3-Nitroaniline	3440	U
100-01-6	4-Nitroaniline	3440	U
98-95-3	Nitrobenzene	729	U
88-75-5	2-Nitrophenol	312	U
100-02-7	4-Nitrophenol	1670	U
621-64-7	N-nitrosodi-n-propylamine	729	U
86-30-6	N-nitrosodiphenylamine	729	U
87-86-5	Pentachlorophenol	3440	U
85-01-8	Phenanthrene	729	U
108-95-2	Phenol	312	U
129-00-0	Pyrene	729	U
117-81-7	Bis(2-ethylhexyl)phthalate	729	U
120-82-1	1,2,4-Trichlorobenzene	729	U
95-95-4	2,4,5-Trichlorophenol	3440	U
88-06-2	2,4,6-Trichlorophenol	312	U
NA	Benzyl Alcohol	1350	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-17.0

Matrix: Soil
% Dry Weight: 74.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69168
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/26/98
Analysis Time: 19:41
Sample QC Group: 6409

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	946	U
208-96-8	Acenaphthylene	946	U
120-12-7	Anthracene	946	U
65-85-0	Benzoic Acid	2160	U
56-55-3	Benzo(a)anthracene	946	U
50-32-8	Benzo(a)pyrene	946	U
205-99-2	Benzo(b)fluoranthene	946	U
191-24-2	Benzo(g,h,i)perylene	946	U
101-55-3	4-Bromophenylphenylether	946	U
85-68-7	Butylbenzylphthalate	946	U
59-50-7	4-Chloro-3-methylphenol	1760	U
106-47-8	4-Chloroaniline	1760	U
111-91-1	bis(2-Chloroethoxy)methane	946	U
111-44-4	bis(2-Chloroethyl)ether	946	U
108-60-1	bis(2-Chloroisopropyl)ether	946	U
91-58-7	2-Chloronaphthalene	946	U
95-57-8	2-Chlorophenol	946	U
7005-72-3	4-Chlorophenylphenylether	946	U
218-01-9	Chrysene	946	U
132-64-9	Dibenzofuran	946	U
53-70-3	Dibenz(a,h)anthracene	946	U
95-50-1	1,2-Dichlorobenzene	946	U
541-73-1	1,3-Dichlorobenzene	946	U
106-46-7	1,4-Dichlorobenzene	946	U
91-94-1	3,3'-Dichlorobenzidine	1760	U
120-83-2	2,4-Dichlorophenol	405	U
84-66-2	Diethylphthalate	946	U
105-67-9	2,4-Dimethylphenol	405	U
131-11-3	Dimethylphthalate	946	U
84-74-2	Di-n-butylphthalate	946	U
534-52-1	4,6-Dinitro-2-methylphenol	4460	U
51-28-5	2,4-Dinitrophenol	4460	U
121-14-2	2,4-dinitrotoluene	946	U
606-20-2	2,6-Dinitrotoluene	946	U
117-84-0	Di-n-octylphthalate	946	U
206-44-0	Fluoranthene	946	U
86-73-7	Fluorene	946	U

000455

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-17.0

Matrix: Soil
% Dry Weight: 74.
Units: ug/kg dry weight

Lab Sample ID: 98-A69168
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	946	U
87-68-3	Hexachlorobutadiene	946	U
77-47-4	Hexachlorocyclopentadiene	946	U
67-72-1	Hexachloroethane	946	U
193-39-5	Indeno(1,2,3-cd)pyrene	946	U
78-59-1	Isophorone	946	U
91-57-6	2-Methylnaphthalene	946	U
95-48-7	2-Methylphenol	405	U
106-44-5	m,p-Methylphenol	405	U
91-20-3	Naphthalene	946	U
88-74-4	2-Nitroaniline	4460	U
99-09-2	3-Nitroaniline	4460	U
100-01-6	4-Nitroaniline	4460	U
98-95-3	Nitrobenzene	946	U
88-75-5	2-Nitrophenol	405	U
100-02-7	4-Nitrophenol	2160	U
621-64-7	N-nitrosodi-n-propylamine	946	U
86-30-6	N-nitrosodiphenylamine	946	U
87-86-5	Pentachlorophenol	4460	U
85-01-8	Phenanthrene	946	U
108-95-2	Phenol	405	U
129-00-0	Pyrene	946	U
117-81-7	Bis(2-ethylhexyl)phthalate	946	U
120-82-1	1,2,4-Trichlorobenzene	946	U
95-95-4	2,4,5-Trichlorophenol	4460	U
88-06-2	2,4,6-Trichlorophenol	405	U
NA	Benzyl Alcohol	1760	U

000456

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-D

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69169
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/26/98
Analysis Time: 20:18
Sample QC Group: 6409

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	909	U
208-96-8	Acenaphthylene	909	U
120-12-7	Anthracene	909	U
65-85-0	Benzoic Acid	2080	U
56-55-3	Benzo(a)anthracene	909	U
50-32-8	Benzo(a)pyrene	909	U
205-99-2	Benzo(b)fluoranthene	909	U
191-24-2	Benzo(g,h,i)perylene	909	U
101-55-3	4-Bromophenylphenylether	909	U
85-68-7	Butylbenzylphthalate	909	U
59-50-7	4-Chloro-3-methylphenol	1690	U
106-47-8	4-Chloroaniline	1690	U
111-91-1	bis(2-Chloroethoxy)methane	909	U
111-44-4	bis(2-Chloroethyl)ether	909	U
108-60-1	bis(2-Chloroisopropyl)ether	909	U
91-58-7	2-Chloronaphthalene	909	U
95-57-8	2-Chlorophenol	909	U
7005-72-3	4-Chlorophenylphenylether	909	U
218-01-9	Chrysene	909	U
132-64-9	Dibenzofuran	909	U
53-70-3	Dibenz(a,h)anthracene	909	U
95-50-1	1,2-Dichlorobenzene	909	U
541-73-1	1,3-Dichlorobenzene	909	U
106-46-7	1,4-Dichlorobenzene	909	U
91-94-1	3,3'-Dichlorobenzidine	1690	U
120-83-2	2,4-Dichlorophenol	390	U
84-66-2	Diethylphthalate	909	U
105-67-9	2,4-Dimethylphenol	390	U
131-11-3	Dimethylphthalate	909	U
84-74-2	Di-n-butylphthalate	909	U
534-52-1	4,6-Dinitro-2-methylphenol	4290	U
51-28-5	2,4-Dinitrophenol	4290	U
121-14-2	2,4-dinitrotoluene	909	U
606-20-2	2,6-Dinitrotoluene	909	U
117-84-0	Di-n-octylphthalate	909	U
206-44-0	Fluoranthene	909	U
86-73-7	Fluorene	909	U

000459

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-D

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight

Lab Sample ID: 98-A69169
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	909	U
87-68-3	Hexachlorobutadiene	909	U
77-47-4	Hexachlorocyclopentadiene	909	U
67-72-1	Hexachloroethane	909	U
193-39-5	Indeno(1,2,3-cd)pyrene	909	U
78-59-1	Isophorone	909	U
91-57-6	2-Methylnaphthalene	909	U
95-48-7	2-Methylphenol	390	U
106-44-5	m,p-Methylphenol	390	U
91-20-3	Naphthalene	909	U
88-74-4	2-Nitroaniline	4290	U
99-09-2	3-Nitroaniline	4290	U
100-01-6	4-Nitroaniline	4290	U
98-95-3	Nitrobenzene	909	U
88-75-5	2-Nitrophenol	390	U
100-02-7	4-Nitrophenol	2080	U
621-64-7	N-nitrosodi-n-propylamine	909	U
86-30-6	N-nitrosodiphenylamine	909	U
87-86-5	Pentachlorophenol	4290	U
85-01-8	Phenanthrene	909	U
108-95-2	Phenol	390	U
129-00-0	Pyrene	909	U
117-81-7	Bis(2-ethylhexyl)phthalate	909	U
120-82-1	1,2,4-Trichlorobenzene	909	U
95-95-4	2,4,5-Trichlorophenol	4290	U
88-06-2	2,4,6-Trichlorophenol	390	U
NA	Benzyl Alcohol	1690	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-19.0

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69170
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/26/98
Analysis Time: 20:55
Sample QC Group: 6409

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	833	U
208-96-8	Acenaphthylene	833	U
120-12-7	Anthracene	833	U
65-85-0	Benzoic Acid	1900	U
56-55-3	Benzo(a)anthracene	833	U
50-32-8	Benzo(a)pyrene	833	U
205-99-2	Benzo(b)fluoranthene	833	U
191-24-2	Benzo(g,h,i)perylene	833	U
101-55-3	4-Bromophenylphenylether	833	U
85-68-7	Butylbenzylphthalate	833	U
59-50-7	4-Chloro-3-methylphenol	1550	U
106-47-8	4-Chloroaniline	1550	U
111-91-1	bis(2-Chloroethoxy)methane	833	U
111-44-4	bis(2-Chloroethyl)ether	833	U
108-60-1	bis(2-Chloroisopropyl)ether	833	U
91-58-7	2-Chloronaphthalene	833	U
95-57-8	2-Chlorophenol	833	U
7005-72-3	4-Chlorophenylphenylether	833	U
218-01-9	Chrysene	833	U
132-64-9	Dibenzofuran	833	U
53-70-3	Dibenz(a,h)anthracene	833	U
95-50-1	1,2-Dichlorobenzene	833	U
541-73-1	1,3-Dichlorobenzene	833	U
106-46-7	1,4-Dichlorobenzene	833	U
91-94-1	3,3'-Dichlorobenzidine	1550	U
120-83-2	2,4-Dichlorophenol	357	U
84-66-2	Diethylphthalate	833	U
105-67-9	2,4-Dimethylphenol	357	U
131-11-3	Dimethylphthalate	833	U
84-74-2	Di-n-butylphthalate	833	U
534-52-1	4,6-Dinitro-2-methylphenol	3930	U
51-28-5	2,4-Dinitrophenol	3930	U
121-14-2	2,4-dinitrotoluene	833	U
606-20-2	2,6-Dinitrotoluene	833	U
117-84-0	Di-n-octylphthalate	833	U
206-44-0	Fluoranthene	833	U
86-73-7	Fluorene	833	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-19.0

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight

Lab Sample ID: 98-A69170
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	833	U
87-68-3	Hexachlorobutadiene	833	U
77-47-4	Hexachlorocyclopentadiene	833	U
67-72-1	Hexachloroethane	833	U
193-39-5	Indeno(1,2,3-cd)pyrene	833	U
78-59-1	Isophorone	833	U
91-57-6	2-Methylnaphthalene	833	U
95-48-7	2-Methylphenol	357	U
106-44-5	m,p-Methylphenol	357	U
91-20-3	Naphthalene	833	U
88-74-4	2-Nitroaniline	3930	U
99-09-2	3-Nitroaniline	3930	U
100-01-6	4-Nitroaniline	3930	U
98-95-3	Nitrobenzene	833	U
88-75-5	2-Nitrophenol	357	U
100-02-7	4-Nitrophenol	1900	U
621-64-7	N-nitrosodi-n-propylamine	833	U
86-30-6	N-nitrosodiphenylamine	833	U
87-86-5	Pentachlorophenol	3930	U
85-01-8	Phenanthrene	833	U
108-95-2	Phenol	357	U
129-00-0	Pyrene	833	U
117-81-7	Bis(2-ethylhexyl)phthalate	833	U
120-82-1	1,2,4-Trichlorobenzene	833	U
95-95-4	2,4,5-Trichlorophenol	3930	U
88-06-2	2,4,6-Trichlorophenol	357	U
NA	Benzyl Alcohol	1550	U

000464

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-6.0

Matrix: Soil
% Dry Weight: 87.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69171
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/28/98
Analysis Time: 21:59
Sample QC Group: 6409

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	4020	U
208-96-8	Acenaphthylene	4020	U
120-12-7	Anthracene	4020	U
65-85-0	Benzoic Acid	9200	U
56-55-3	Benzo(a)anthracene	4020	U
50-32-8	Benzo(a)pyrene	4020	U
205-99-2	Benzo(b)fluoranthene	4020	U
191-24-2	Benzo(g,h,i)perylene	4020	U
101-55-3	4-Bromophenylphenylether	4020	U
85-68-7	Butylbenzylphthalate	4020	U
59-50-7	4-Chloro-3-methylphenol	7470	U
106-47-8	4-Chloroaniline	7470	U
111-91-1	bis(2-Chloroethoxy)methane	4020	U
111-44-4	bis(2-Chloroethyl)ether	4020	U
108-60-1	bis(2-Chloroisopropyl)ether	4020	U
91-58-7	2-Chloronaphthalene	4020	U
95-57-8	2-Chlorophenol	4020	U
7005-72-3	4-Chlorophenylphenylether	4020	U
218-01-9	Chrysene	4020	U
132-64-9	Dibenzofuran	4020	U
53-70-3	Dibenz(a,h)anthracene	4020	U
95-50-1	1,2-Dichlorobenzene	4020	U
541-73-1	1,3-Dichlorobenzene	4020	U
106-46-7	1,4-Dichlorobenzene	4020	U
91-94-1	3,3'-Dichlorobenzidine	7470	U
120-83-2	2,4-Dichlorophenol	1720	U
84-66-2	Diethylphthalate	4020	U
105-67-9	2,4-Dimethylphenol	1720	U
131-11-3	Dimethylphthalate	4020	U
84-74-2	Di-n-butylphthalate	4020	U
534-52-1	4,6-Dinitro-2-methylphenol	19000	U
51-28-5	2,4-Dinitrophenol	19000	U
121-14-2	2,4-dinitrotoluene	4020	U
606-20-2	2,6-Dinitrotoluene	4020	U
117-84-0	Di-n-octylphthalate	4020	U
206-44-0	Fluoranthene	4020	U
86-73-7	Fluorene	4020	U

000467

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-6.0

Matrix: Soil
% Dry Weight: 87.
Units: ug/kg dry weight

Lab Sample ID: 98-A69171
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	4020	U
87-68-3	Hexachlorobutadiene	4020	U
77-47-4	Hexachlorocyclopentadiene	4020	U
67-72-1	Hexachloroethane	4020	U
193-39-5	Indeno(1,2,3-cd)pyrene	4020	U
78-59-1	Isophorone	4020	U
91-57-6	2-Methylnaphthalene	4020	U
95-48-7	2-Methylphenol	1720	U
106-44-5	m,p-Methylphenol	1720	U
91-20-3	Naphthalene	4020	U
88-74-4	2-Nitroaniline	19000	U
99-09-2	3-Nitroaniline	19000	U
100-01-6	4-Nitroaniline	19000	U
98-95-3	Nitrobenzene	4020	U
88-75-5	2-Nitrophenol	1720	U
100-02-7	4-Nitrophenol	9200	U
621-64-7	N-nitrosodi-n-propylamine	4020	U
86-30-6	N-nitrosodiphenylamine	4020	U
87-86-5	Pentachlorophenol	19000	U
85-01-8	Phenanthrene	4020	U
108-95-2	Phenol	1720	U
129-00-0	Pyrene	4020	U
117-81-7	Bis(2-ethylhexyl)phthalate	4020	U
120-82-1	1,2,4-Trichlorobenzene	4020	U
95-95-4	2,4,5-Trichlorophenol	19000	U
88-06-2	2,4,6-Trichlorophenol	1720	U
NA	Benzyl Alcohol	7470	U

000463

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-17.0

Matrix: Soil
% Dry Weight: 83.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69172
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/26/98
Analysis Time: 21:32
Sample QC Group: 6409

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	843	U
208-96-8	Acenaphthylene	843	U
120-12-7	Anthracene	843	U
65-85-0	Benzoic Acid	1930	U
56-55-3	Benzo(a)anthracene	843	U
50-32-8	Benzo(a)pyrene	843	U
205-99-2	Benzo(b)fluoranthene	843	U
191-24-2	Benzo(g,h,i)perylene	843	U
101-55-3	4-Bromophenylphenylether	843	U
85-68-7	Butylbenzylphthalate	843	U
59-50-7	4-Chloro-3-methylphenol	1570	U
106-47-8	4-Chloroaniline	1570	U
111-91-1	bis(2-Chloroethoxy)methane	843	U
111-44-4	bis(2-Chloroethyl)ether	843	U
108-60-1	bis(2-Chloroisopropyl)ether	843	U
91-58-7	2-Chloronaphthalene	843	U
95-57-8	2-Chlorophenol	843	U
7005-72-3	4-Chlorophenylphenylether	843	U
218-01-9	Chrysene	843	U
132-64-9	Dibenzofuran	843	U
53-70-3	Dibenz(a,h)anthracene	843	U
95-50-1	1,2-Dichlorobenzene	843	U
541-73-1	1,3-Dichlorobenzene	843	U
106-46-7	1,4-Dichlorobenzene	843	U
91-94-1	3,3'-Dichlorobenzidine	1570	U
120-83-2	2,4-Dichlorophenol	361	U
84-66-2	Diethylphthalate	843	U
105-67-9	2,4-Dimethylphenol	361	U
131-11-3	Dimethylphthalate	843	U
84-74-2	Di-n-butylphthalate	843	U
534-52-1	4,6-Dinitro-2-methylphenol	3980	U
51-28-5	2,4-Dinitrophenol	3980	U
121-14-2	2,4-dinitrotoluene	843	U
606-20-2	2,6-Dinitrotoluene	843	U
117-84-0	Di-n-octylphthalate	843	U
206-44-0	Fluoranthene	843	U
86-73-7	Fluorene	843	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-17.0

Matrix: Soil
% Dry Weight: 83.
Units: ug/kg dry weight

Lab Sample ID: 98-A69172
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	843	U
87-68-3	Hexachlorobutadiene	843	U
77-47-4	Hexachlorocyclopentadiene	843	U
67-72-1	Hexachloroethane	843	U
193-39-5	Indeno(1,2,3-cd)pyrene	843	U
78-59-1	Isophorone	843	U
91-57-6	2-Methylnaphthalene	843	U
95-48-7	2-Methylphenol	361	U
106-44-5	m,p-Methylphenol	361	U
91-20-3	Naphthalene	843	U
88-74-4	2-Nitroaniline	3980	U
99-09-2	3-Nitroaniline	3980	U
100-01-6	4-Nitroaniline	3980	U
98-95-3	Nitrobenzene	843	U
88-75-5	2-Nitrophenol	361	U
100-02-7	4-Nitrophenol	1930	U
621-64-7	N-nitrosodi-n-propylamine	843	U
86-30-6	N-nitrosodiphenylamine	843	U
87-86-5	Pentachlorophenol	3980	U
85-01-8	Phenanthrene	843	U
108-95-2	Phenol	361	U
129-00-0	Pyrene	843	U
117-81-7	Bis(2-ethylhexyl)phthalate	843	U
120-82-1	1,2,4-Trichlorobenzene	843	U
95-95-4	2,4,5-Trichlorophenol	3980	U
88-06-2	2,4,6-Trichlorophenol	361	U
NA	Benzyl Alcohol	1570	U

000472

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B9-15.0

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69173
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/26/98
Analysis Time: 22:09
Sample QC Group: 6409

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	909	U
208-96-8	Acenaphthylene	909	U
120-12-7	Anthracene	909	U
65-85-0	Benzoic Acid	2080	U
56-55-3	Benzo(a)anthracene	909	U
50-32-8	Benzo(a)pyrene	909	U
205-99-2	Benzo(b)fluoranthene	909	U
191-24-2	Benzo(g,h,i)perylene	909	U
101-55-3	4-Bromophenylphenylether	909	U
85-68-7	Butylbenzylphthalate	909	U
59-50-7	4-Chloro-3-methylphenol	1690	U
106-47-8	4-Chloroaniline	1690	U
111-91-1	bis(2-Chloroethoxy)methane	909	U
111-44-4	bis(2-Chloroethyl)ether	909	U
108-60-1	bis(2-Chloroisopropyl)ether	909	U
91-58-7	2-Chloronaphthalene	909	U
95-57-8	2-Chlorophenol	909	U
7005-72-3	4-Chlorophenylphenylether	909	U
218-01-9	Chrysene	909	U
132-64-9	Dibenzofuran	909	U
53-70-3	Dibenz(a,h)anthracene	909	U
95-50-1	1,2-Dichlorobenzene	909	U
541-73-1	1,3-Dichlorobenzene	909	U
106-46-7	1,4-Dichlorobenzene	909	U
91-94-1	3,3'-Dichlorobenzidine	1690	U
120-83-2	2,4-Dichlorophenol	390	U
84-66-2	Diethylphthalate	909	U
105-67-9	2,4-Dimethylphenol	390	U
131-11-3	Dimethylphthalate	909	U
84-74-2	Di-n-butylphthalate	909	U
534-52-1	4,6-Dinitro-2-methylphenol	4290	U
51-28-5	2,4-Dinitrophenol	4290	U
121-14-2	2,4-dinitrotoluene	909	U
606-20-2	2,6-Dinitrotoluene	909	U
117-84-0	Di-n-octylphthalate	909	U
206-44-0	Fluoranthene	909	U
86-73-7	Fluorene	909	U

000475

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B9-15.0

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight

Lab Sample ID: 98-A69173
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	909	U
87-68-3	Hexachlorobutadiene	909	U
77-47-4	Hexachlorocyclopentadiene	909	U
67-72-1	Hexachloroethane	909	U
193-39-5	Indeno(1,2,3-cd)pyrene	909	U
78-59-1	Isophorone	909	U
91-57-6	2-Methylnaphthalene	909	U
95-48-7	2-Methylphenol	390	U
106-44-5	m,p-Methylphenol	390	U
91-20-3	Naphthalene	909	U
88-74-4	2-Nitroaniline	4290	U
99-09-2	3-Nitroaniline	4290	U
100-01-6	4-Nitroaniline	4290	U
98-95-3	Nitrobenzene	909	U
88-75-5	2-Nitrophenol	390	U
100-02-7	4-Nitrophenol	2080	U
621-64-7	N-nitrosodi-n-propylamine	909	U
86-30-6	N-nitrosodiphenylamine	909	U
87-86-5	Pentachlorophenol	4290	U
85-01-8	Phenanthrene	909	U
108-95-2	Phenol	390	U
129-00-0	Pyrene	909	U
117-81-7	Bis(2-ethylhexyl)phthalate	909	U
120-82-1	1,2,4-Trichlorobenzene	909	U
95-95-4	2,4,5-Trichlorophenol	4290	U
88-06-2	2,4,6-Trichlorophenol	390	U
NA	Benzyl Alcohol	1690	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B10-15.5

Matrix: Soil
% Dry Weight: 85.
Units: ug/kg dry weight
Dilution Factor: 5.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69174
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/28/98
Analysis Time: 22:36
Sample QC Group: 3387

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	4120	U
208-96-8	Acenaphthylene	4120	U
120-12-7	Anthracene	4120	U
65-85-0	Benzoic Acid	9410	U
56-55-3	Benzo(a)anthracene	4120	U
50-32-8	Benzo(a)pyrene	4120	U
205-99-2	Benzo(b)fluoranthene	4120	U
191-24-2	Benzo(g,h,i)perylene	4120	U
101-55-3	4-Bromophenylphenylether	4120	U
85-68-7	Butylbenzylphthalate	4120	U
59-50-7	4-Chloro-3-methylphenol	7650	U
106-47-8	4-Chloroaniline	7650	U
111-91-1	bis(2-Chloroethoxy)methane	4120	U
111-44-4	bis(2-Chloroethyl)ether	4120	U
108-60-1	bis(2-Chloroisopropyl)ether	4120	U
91-58-7	2-Chloronaphthalene	4120	U
95-57-8	2-Chlorophenol	4120	U
7005-72-3	4-Chlorophenylphenylether	4120	U
218-01-9	Chrysene	4120	U
132-64-9	Dibenzofuran	4120	U
53-70-3	Dibenz(a,h)anthracene	4120	U
95-50-1	1,2-Dichlorobenzene	4120	U
541-73-1	1,3-Dichlorobenzene	4120	U
106-46-7	1,4-Dichlorobenzene	4120	U
91-94-1	3,3'-Dichlorobenzidine	7650	U
120-83-2	2,4-Dichlorophenol	1760	U
84-66-2	Diethylphthalate	4120	U
105-67-9	2,4-Dimethylphenol	1760	U
131-11-3	Dimethylphthalate	4120	U
84-74-2	Di-n-butylphthalate	4120	U
534-52-1	4,6-Dinitro-2-methylphenol	19400	U
51-28-5	2,4-Dinitrophenol	19400	U
121-14-2	2,4-dinitrotoluene	4120	U
606-20-2	2,6-Dinitrotoluene	4120	U
117-84-0	Di-n-octylphthalate	4120	U
206-44-0	Fluoranthene	4120	U
86-73-7	Fluorene	4120	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B10-15.5

Matrix: Soil
% Dry Weight: 85.
Units: ug/kg dry weight

Lab Sample ID: 98-A69174
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	4120	U
87-68-3	Hexachlorobutadiene	4120	U
77-47-4	Hexachlorocyclopentadiene	4120	U
67-72-1	Hexachloroethane	4120	U
193-39-5	Indeno(1,2,3-cd)pyrene	4120	U
78-59-1	Isophorone	4120	U
91-57-6	2-Methylnaphthalene	4120	U
95-48-7	2-Methylphenol	1760	U
106-44-5	m,p-Methylphenol	1760	U
91-20-3	Naphthalene	4120	U
88-74-4	2-Nitroaniline	19400	U
99-09-2	3-Nitroaniline	19400	U
100-01-6	4-Nitroaniline	19400	U
98-95-3	Nitrobenzene	4120	U
88-75-5	2-Nitrophenol	1760	U
100-02-7	4-Nitrophenol	9410	U
621-64-7	N-nitrosodi-n-propylamine	4120	U
86-30-6	N-nitrosodiphenylamine	4120	U
87-86-5	Pentachlorophenol	19400	U
85-01-8	Phenanthrene	4120	U
108-95-2	Phenol	1760	U
129-00-0	Pyrene	4120	U
117-81-7	Bis(2-ethylhexyl)phthalate	785	J
120-82-1	1,2,4-Trichlorobenzene	4120	U
95-95-4	2,4,5-Trichlorophenol	19400	U
88-06-2	2,4,6-Trichlorophenol	1760	U
NA	Benzyl Alcohol	7650	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-E

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69175
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/27/98
Analysis Time: 0:00
Sample QC Group: 3387

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	833	U
208-96-8	Acenaphthylene	833	U
120-12-7	Anthracene	80	J
65-85-0	Benzoic Acid	1900	U
56-55-3	Benzo(a)anthracene	80	J
50-32-8	Benzo(a)pyrene	833	U
205-99-2	Benzo(b)fluoranthene	833	U
191-24-2	Benzo(g,h,i)perylene	833	U
101-55-3	4-Bromophenylphenylether	833	U
85-68-7	Butylbenzylphthalate	833	U
59-50-7	4-Chloro-3-methylphenol	1550	U
106-47-8	4-Chloroaniline	1550	U
111-91-1	bis(2-Chloroethoxy)methane	833	U
111-44-4	bis(2-Chloroethyl)ether	833	U
108-60-1	bis(2-Chloroisopropyl)ether	833	U
91-58-7	2-Chloronaphthalene	833	U
95-57-8	2-Chlorophenol	833	U
7005-72-3	4-Chlorophenylphenylether	833	U
218-01-9	Chrysene	80	J
132-64-9	Dibenzofuran	833	U
53-70-3	Dibenz(a,h)anthracene	833	U
95-50-1	1,2-Dichlorobenzene	833	U
541-73-1	1,3-Dichlorobenzene	833	U
106-46-7	1,4-Dichlorobenzene	833	U
91-94-1	3,3'-Dichlorobenzidine	1550	U
120-83-2	2,4-Dichlorophenol	357	U
84-66-2	Diethylphthalate	833	U
105-67-9	2,4-Dimethylphenol	357	U
131-11-3	Dimethylphthalate	833	U
84-74-2	Di-n-butylphthalate	833	U
534-52-1	4,6-Dinitro-2-methylphenol	3930	U
51-28-5	2,4-Dinitrophenol	3930	U
121-14-2	2,4-dinitrotoluene	833	U
606-20-2	2,6-Dinitrotoluene	833	U
117-84-0	Di-n-octylphthalate	833	U
206-44-0	Fluoranthene	318	J
86-73-7	Fluorene	833	U

000484

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-E

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight

Lab Sample ID: 98-A69175
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	833	U
87-68-3	Hexachlorobutadiene	833	U
77-47-4	Hexachlorocyclopentadiene	833	U
67-72-1	Hexachloroethane	833	U
193-39-5	Indeno(1,2,3-cd)pyrene	833	U
78-59-1	Isophorone	833	U
91-57-6	2-Methylnaphthalene	833	U
95-48-7	2-Methylphenol	833	U
106-44-5	m,p-Methylphenol	357	U
91-20-3	Naphthalene	357	U
88-74-4	2-Nitroaniline	833	U
99-09-2	3-Nitroaniline	3930	U
100-01-6	4-Nitroaniline	3930	U
98-95-3	Nitrobenzene	3930	U
88-75-5	2-Nitrophenol	833	U
100-02-7	4-Nitrophenol	357	U
621-64-7	N-nitrosodi-n-propylamine	1900	U
86-30-6	N-nitrosodiphenylamine	833	U
87-86-5	Pentachlorophenol	833	U
85-01-8	Phenanthrene	3930	U
108-95-2	Phenol	158	J
129-00-0	Pyrene	357	U
117-81-7	Bis(2-ethylhexyl)phthalate	238	J
120-82-1	1,2,4-Trichlorobenzene	873	
95-95-4	2,4,5-Trichlorophenol	833	U
88-06-2	2,4,6-Trichlorophenol	3930	U
NA	Benzyl Alcohol	357	U
		1550	U

0000485

COPY 1

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B11-18.5

Matrix: Soil
% Dry Weight: 89.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69176
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/26/98
Analysis Time: 22:46
Sample QC Group: 6409

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
83-32-9	Acenaphthene	787	U
208-96-8	Acenaphthylene	787	U
120-12-7	Anthracene	787	U
65-85-0	Benzoic Acid	1800	U
56-55-3	Benzo(a)anthracene	787	U
50-32-8	Benzo(a)pyrene	787	U
205-99-2	Benzo(b)fluoranthene	787	U
191-24-2	Benzo(g,h,i)perylene	787	U
101-55-3	4-Bromophenylphenylether	787	U
85-68-7	Butylbenzylphthalate	787	U
59-50-7	4-Chloro-3-methylphenol	1460	U
106-47-8	4-Chloroaniline	1460	U
111-91-1	bis(2-Chloroethoxy)methane	787	U
111-44-4	bis(2-Chloroethyl)ether	787	U
108-60-1	bis(2-Chloroisopropyl)ether	787	U
91-58-7	2-Chloronaphthalene	787	U
95-57-8	2-Chlorophenol	787	U
7005-72-3	4-Chlorophenylphenylether	787	U
218-01-9	Chrysene	787	U
132-64-9	Dibenzofuran	787	U
53-70-3	Dibenz(a,h)anthracene	787	U
95-50-1	1,2-Dichlorobenzene	787	U
541-73-1	1,3-Dichlorobenzene	787	U
106-46-7	1,4-Dichlorobenzene	787	U
91-94-1	3,3'-Dichlorobenzidine	1460	U
120-83-2	2,4-Dichlorophenol	337	U
84-66-2	Diethylphthalate	787	U
105-67-9	2,4-Dimethylphenol	337	U
131-11-3	Dimethylphthalate	787	U
84-74-2	Di-n-butylphthalate	787	U
534-52-1	4,6-Dinitro-2-methylphenol	3710	U
51-28-5	2,4-Dinitrophenol	3710	U
121-14-2	2,4-dinitrotoluene	787	U
606-20-2	2,6-Dinitrotoluene	787	U
117-84-0	Di-n-octylphthalate	787	U
206-44-0	Fluoranthene	787	U
86-73-7	Fluorene	787	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B11-18.5

Matrix: Soil
% Dry Weight: 89.
Units: ug/kg dry weight

Lab Sample ID: 98-A69176
Date Sampled: 6/12/98
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
118-74-1	Hexachlorobenzene	787	U
87-68-3	Hexachlorobutadiene	787	U
77-47-4	Hexachlorocyclopentadiene	787	U
67-72-1	Hexachloroethane	787	U
193-39-5	Indeno(1,2,3-cd)pyrene	787	U
78-59-1	Isophorone	787	U
91-57-6	2-Methylnaphthalene	787	U
95-48-7	2-Methylphenol	337	U
106-44-5	m,p-Methylphenol	337	U
91-20-3	Naphthalene	787	U
88-74-4	2-Nitroaniline	3710	U
99-09-2	3-Nitroaniline	3710	U
100-01-6	4-Nitroaniline	3710	U
98-95-3	Nitrobenzene	787	U
88-75-5	2-Nitrophenol	337	U
100-02-7	4-Nitrophenol	1800	U
621-64-7	N-nitrosodi-n-propylamine	787	U
86-30-6	N-nitrosodiphenylamine	787	U
87-86-5	Pentachlorophenol	3710	U
85-01-8	Phenanthrene	787	U
108-95-2	Phenol	337	U
129-00-0	Pyrene	787	U
117-81-7	Bis(2-ethylhexyl)phthalate	787	U
120-82-1	1,2,4-Trichlorobenzene	787	U
95-95-4	2,4,5-Trichlorophenol	3710	U
88-06-2	2,4,6-Trichlorophenol	337	U
NA	Benzyl Alcohol	1460	U

000493

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG
Dilution Factor: 1
Analysis Method: SW8270C
Delivery Group: 103948
Instrument: HP-13
Grams Extracted: 30.0 g
Extract Vol: 1.0 ml

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/13/98
Analysis Date: 6/26/98
Analysis Time: 17:47
Sample QC Group: 6409

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
83-32-9	Acenaphthene	700	....	U
208-96-8	Acenaphthylene	700	....	U
120-12-7	Anthracene	700	....	U
65-85-0	Benzoic Acid	1600	....	U
56-55-3	Benzo(a)anthracene	700	....	U
50-32-8	Benzo(a)pyrene	700	....	U
205-99-2	Benzo(b)fluoranthene	700	....	U
191-24-2	Benzo(g,h,i)perylene	700	....	U
85-68-7	Butylbenzylphthalate	700	....	U
59-50-7	4-Chloro-3-methylphenol	1300	....	U
106-47-8	4-Chloroaniline	1300	....	U
111-91-1	bis(2-Chloroethoxy)methane	700	....	U
111-44-4	bis(2-Chloroethyl)ether	700	....	U
108-60-1	bis(2-Chloroisopropyl)ether	700	....	U
91-58-7	2-Chloronaphthalene	700	....	U
95-57-8	2-Chlorophenol	700	....	U
7005-72-3	4-Chlorophenylphenylether	700	....	U
218-01-9	Chrysene	700	....	U
132-64-9	Dibenzofuran	700	....	U
53-70-3	Dibenz(a,h)anthracene	700	....	U
95-50-1	1,2-Dichlorobenzene	700	....	U
541-73-1	1,3-Dichlorobenzene	700	....	U
106-46-7	1,4-Dichlorobenzene	700	....	U
91-94-1	3,3'-Dichlorobenzidine	1300	....	U
120-83-2	2,4-Dichlorophenol	300	....	U
84-66-2	Diethylphthalate	700	....	U
105-67-9	2,4-Dimethylphenol	300	....	U
131-11-3	Dimethylphthalate	700	....	U
84-74-2	Di-n-butylphthalate	700	....	U
534-52-1	4,6-Dinitro-2-methylphenol	3300	....	U
51-28-5	2,4-Dinitrophenol	3300	....	U
121-14-2	2,4-dinitrotoluene	700	....	U
606-20-2	2,6-Dinitrotoluene	700	....	U
117-84-0	Di-n-octylphthalate	700	....	U

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG

Lab Sample ID: BLANK
Date Sampled:
Date Received: 6/13/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
206-44-0	Fluoranthene	700	....	U
86-73-7	Fluorene	700	....	U
118-74-1	Hexachlorobenzene	700	....	U
87-68-3	Hexachlorobutadiene	700	....	U
77-47-4	Hexachlorocyclopentadiene	700	....	U
67-72-1	Hexachloroethane	700	....	U
193-39-5	Indeno(1,2,3-cd)pyrene	700	....	U
78-59-1	Isophorone	700	....	U
91-57-6	2-Methylnaphthalene	700	....	U
95-48-7	2-Methylphenol	300	....	U
106-44-5	m,p-Methylphenol	300	....	U
91-20-3	Naphthalene	700	....	U
88-74-4	2-Nitroaniline	3300	....	U
99-09-2	3-Nitroaniline	3300	....	U
100-01-6	4-Nitroaniline	3300	....	U
98-95-3	Nitrobenzene	700	....	U
88-75-5	2-Nitrophenol	300	....	U
100-02-7	4-Nitrophenol	1600	....	U
621-64-7	N-nitrosodi-n-propylamine	700	....	U
86-30-6	N-nitrosodiphenylamine	700	....	U
87-86-5	Pentachlorophenol	3300	....	U
85-01-8	Phenanthrene	700	....	U
108-95-2	Phenol	300	....	U
129-00-0	Pyrene	700	....	U
117-81-7	Bis(2-ethylhexyl)phthalate	700	....	U
120-82-1	1,2,4-Trichlorobenzene	700	....	U
95-95-4	2,4,5-Trichlorophenol	3300	....	U
88-06-2	2,4,6-Trichlorophenol	300	....	U

000497

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

EQUIP. BLANK 2

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: HP-15

Lab Sample ID: 98-A69160
Date Sampled:: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/19/98
Analysis Time: 1:41
Sample QC Group: 6622

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
.....	TPH (Gasoline Range)	100.	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L

Dilution Factor: 1
Analysis Method: SW8015
Delivery Group: 103948
Instrument: HP-15

Lab Sample ID: BLANK
Date Sampled: 6/12/98
Date Received: 6/13/98

Analysis Date: 6/19/98
Analysis Time: ~~1:41~~ 00:50
Sample QC Group: 6622

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
.....	TPH (Gasoline Range)	100. ...	U

000637

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-3.0

Matrix: Soil
% Dry Weight: 92.
Units: ug/kg dry weight
Dilution Factor: 10.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69166
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 14:35
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	159000	

000693

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-19.0

Matrix: Soil
% Dry Weight: 96.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69167
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 15:03
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1040	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-17.0

Matrix: Soil
% Dry Weight: 74.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69168
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 15:31
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1350	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-D

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69169
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 16:55
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1300	U

000702

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-19.0

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69170
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 17:23
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1190	U

000705

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-6.0

Matrix: Soil
% Dry Weight: 87.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69171
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 17:51
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1150	U

000708

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-17.0

Matrix: Soil
% Dry Weight: 83.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69172
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 18:19
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	14100	

000711

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B9-15.0

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69173
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 18:47
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1300	U

000714

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B10-15.5

Matrix: Soil
% Dry Weight: 85.
Units: ug/kg dry weight
Dilution Factor: 2.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69174
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 19:16
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	306000....	

000717

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-E

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight
Dilution Factor: 2.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69175
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 19:44
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	310000....	

000720

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B11-16.5

Matrix: Soil
% Dry Weight: 89.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: 98-A69176
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 20:12
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1120	U

000723

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG
Dilution Factor: 1
Analysis Method: SW8015
Delivery Group: 103948
Instrument: 9001-B

Lab Sample ID: BLANK
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/21/98
Analysis Time: 11:46
Sample QC Group: 6621

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Gasoline Range)	1000	U

000726

000725

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

EQUIP. BLANK 2

Matrix: Water
pH:
Units: ug/l
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Vol Extracted: 1000 ml
Extract Vol: 1.00 ml

Lab Sample ID: 98-A69160
Date Sampled:: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/19/98
Analysis Time: 21:31
Sample QC Group: 6316

Extraction Date: 6/18/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	1000	U

Sample Identification

BLANK

Matrix: Water
% Dry Weight:
Units: UG/L
.oop entered 0.02
noloop
Dilution Factor: 1
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Vol Extracted: 1000 ml
Extract Vol: 1.0 ml

Lab Sample ID: BLANK
Date Sampled: 6/12/98
Date Received: 6/13/98

Analysis Date: 6/19/98
Analysis Time: 20:43
Sample QC Group: 6316

Extraction Date: 6/18/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	1000	U

000785

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-3.0

Matrix: Soil
% Dry Weight: 92.
Units: ug/kg dry weight
Dilution Factor: 20.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69166
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 2/98
Analysis Time: 1:24
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	76100	

000818

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-19.0

Matrix: Soil
% Dry Weight: 96.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69167
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 1/98
Analysis Time: 20:32
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	2500	

000820

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-17.0

Matrix: Soil
% Dry Weight: 74.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69168
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 1/98
Analysis Time: 21:21
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	3190	

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-D

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69169
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 1/98
Analysis Time: 22:09
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	11900	

000824

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-19.0

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69170
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 2/98
Analysis Time: 2:13
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	15500	

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-6.0

Matrix: Soil
% Dry Weight: 87.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69171
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 2/98
Analysis Time: 6:15
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	81800	

000828

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-17.0

Matrix: Soil
% Dry Weight: 83.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69172
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 1/98
Analysis Time: 22:58
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	88200....	

000830

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B9-15.0

Matrix: Soil
% Dry Weight: 77.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69173
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 1/98
Analysis Time: 23:47
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	3170	

000832

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B10-15.5

Matrix: Soil
% Dry Weight: 85.
Units: ug/kg dry weight
Dilution Factor: 100.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69174
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 2/98
Analysis Time: 8:40
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	16700	

000834

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-E

Matrix: Soil
% Dry Weight: 84.
Units: ug/kg dry weight
Dilution Factor: 100.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69175
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 2/98
Analysis Time: 9:29
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	16700.	

000836

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B11-18.5

Matrix: Soil
% Dry Weight: 89.
Units: ug/kg dry weight
Dilution Factor: 1.
Analysis Method: SW8015
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: 98-A69176
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 2/98
Analysis Time: 0:35
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	7550	

000838

Sample Identification

BLANK

Matrix: Soil
% Dry Weight: 100
Units: UG/KG
Dilution Factor: 1
Analysis Method: SW8270B
Delivery Group: 103948
Instrument: PE-5
Grams Extracted: 25.0 g
Extract Vol: 1.0 ml

Lab Sample ID: BLANK
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 7/ 2/98
Analysis Time: 1:24
Sample QC Group: 6616

Extraction Date: 6/24/98

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
NA	TPH (Diesel Range)	10000	U

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B7-1.0

Matrix: Soil
% Dry Weight: 87.
Units: mg/kg dry weight
Dilution Factor: 1.
Analysis Method: SW6010B
Delivery Group: I03948
Instrument: TRACE
Mercury DilFact: 1.
Mercury Method: SW7141
Mercury Instrument: PS-200

Lab Sample ID: 98-A69162
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/24/98
Analysis Time: 8:53
Sample QC Group: 5015

Mercury Date: 6/24/98
Mercury Time: 23:20
Mercury QC Group: 5026

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
7429-90-5	Aluminum	12800	
7440-36-0	Antimony	45.4	U
7440-38-2	Arsenic	3.18	J
7440-39-3	Barium	74.9	
7440-41-7	Beryllium	0.34	U
7440-43-9	Cadmium	4.54	U
7440-47-3	Chromium	14.4	
7440-48-4	Cobalt	3.63	J
7440-50-8	Copper	6.59	J
7439-92-1	Lead	36.6	J
7439-96-5	Manganese	243.	
7439-97-6	Mercury	0.11	U
7439-98-7	Molybdenum	9.09	U
7440-02-0	Nickel	9.31	J
7782-49-2	Selenium	90.9	U
7440-22-4	Silver	7.95	U
7440-28-0	Thallium	45.4	U
7440-62-2	Vanadium	14.1	
7440-66-6	Zinc	49.3	

000872

COPY 1

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-DUP-C

Matrix: Soil
% Dry Weight: 86.
Units: mg/kg dry weight
Dilution Factor: 1.
Analysis Method: SW6010B
Delivery Group: 103948
Instrument: TRACE
Mercury DilFact: 1.
Mercury Method: SW7141
Mercury Instrument: PS-200

Lab Sample ID: 98-A69163
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/24/98
Analysis Time: 8:55
Sample QC Group: 5015

Mercury Date: 6/24/98
Mercury Time: 23:20
Mercury QC Group: 5026

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
7429-90-5	Aluminum	13800	
7440-36-0	Antimony	45.5	U
7440-38-2	Arsenic	4.23	J
7440-39-3	Barium	119.	
7440-41-7	Beryllium	0.34	U
7440-43-9	Cadmium	4.55	U
7440-47-3	Chromium	11.9	
7440-48-4	Cobalt	4.55	J
7440-50-8	Copper	6.37	J
7439-92-1	Lead	18.8	J
7439-96-5	Manganese	383.	
7439-97-6	Mercury	0.12	U
7439-98-7	Molybdenum	9.10	U
7440-02-0	Nickel	9.10	J
7782-49-2	Selenium	91.0	U
7440-22-4	Silver	7.97	U
7440-28-0	Thallium	45.5	U
7440-62-2	Vanadium	12.6	
7440-66-6	Zinc	48.5	

000873

COPY 1

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B8-1.0

Matrix: Soil
% Dry Weight: 85.
Units: mg/kg dry weight
Dilution Factor: 1.
Analysis Method: SW6010B
Delivery Group: 103948
Instrument: TRACE
Mercury DilFact: 1.
Mercury Method: SW7141
Mercury Instrument: PS-200

Lab Sample ID: 98-A69164
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/24/98
Analysis Time: 8:59
Sample QC Group: 5015

Mercury Date: 6/24/98
Mercury Time: 23:20
Mercury QC Group: 5026

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
7429-90-5	Aluminum	16000	
7440-36-0	Antimony	45.6	U
7440-38-2	Arsenic	2.74	J
7440-39-3	Barium	51.2	
7440-41-7	Beryllium	0.34	U
7440-43-9	Cadmium	4.56	U
7440-47-3	Chromium	11.6	
7440-48-4	Cobalt	8.00	U
7440-50-8	Copper	2.40	J
7439-92-1	Lead	6.86	J
7439-96-5	Manganese	126.	
7439-97-6	Mercury	0.12	U
7439-98-7	Molybdenum	9.14	U
7440-02-0	Nickel	6.62	J
7782-49-2	Selenium	91.4	U
7440-22-4	Silver	8.00	U
7440-28-0	Thallium	45.6	U
7440-62-2	Vanadium	13.9	
7440-66-6	Zinc	27.4	

N

000874

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B10-1.0

Matrix: Soil
% Dry Weight: 96.
Units: mg/kg dry weight
Dilution Factor: 1.
Analysis Method: SW6010B
Delivery Group: 103948
Instrument: TRACE
Mercury DilFact: 1.
Mercury Method: SW7141
Mercury Instrument: PS-200

Lab Sample ID: 98-A69165
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/24/98
Analysis Time: 9:01
Sample QC Group: 5015

Mercury Date: 6/24/98
Mercury Time: 23:20
Mercury QC Group: 5026

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
7429-90-5	Aluminum	2780	
7440-36-0	Antimony	41.1	U
7440-38-2	Arsenic	28.9	J
7440-39-3	Barium	19.4	
7440-41-7	Beryllium	0.31	U
7440-43-9	Cadmium	4.11	U
7440-47-3	Chromium	4.32	J
7440-48-4	Cobalt	7.21	U
7440-50-8	Copper	6.18	U
7439-92-1	Lead	4.94	J
7439-96-5	Manganese	95.9	
7439-97-6	Mercury	0.10	U
7439-98-7	Molybdenum	8.24	U
7440-02-0	Nickel	2.06	J
7782-49-2	Selenium	82.4	U
7440-22-4	Silver	7.21	U
7440-28-0	Thallium	41.1	U
7440-62-2	Vanadium	6.79	J
7440-66-6	Zinc	11.1	

000875

SPECIALIZED ASSAYS, INC.

2960 Foster Creighton Dr.
P.O. Box 40566
Nashville, TN 37204-0566
Phone 1-615-726-0177

Sample Identification

FC2-B6-3.0

Matrix: Soil
% Dry Weight: 92.
Units: mg/kg dry weight
Dilution Factor: 1.
Analysis Method: SW6010B
Delivery Group: 103948
Instrument: TRACE
Mercury DilFact: 1.
Mercury Method: SW7141
Mercury Instrument: PS-200

Lab Sample ID: 98-A69166
Date Sampled: 6/12/98
Date Received: 6/13/98
Analysis Date: 6/24/98
Analysis Time: 9:06
Sample QC Group: 5015

Mercury Date: 6/24/98
Mercury Time: 23:20
Mercury QC Group: 5026

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION	FLAG
7429-90-5	Aluminum	3360	
7440-36-0	Antimony	42.5	U
7440-38-2	Arsenic	3.39	J
7440-39-3	Barium	39.7	
7440-41-7	Beryllium	0.32	U
7440-43-9	Cadmium	13.6	
7440-47-3	Chromium	29.9	
7440-48-4	Cobalt	7.43	U
7440-50-8	Copper	29.5	
7439-92-1	Lead	80.7	
7439-96-5	Manganese	107.	
7439-97-6	Mercury	0.43	
7439-98-7	Molybdenum	8.49	U
7440-02-0	Nickel	40.8	
7782-49-2	Selenium	84.9	U
7440-22-4	Silver	8.49	
7440-28-0	Thallium	42.5	U
7440-62-2	Vanadium	7.01	J
7440-66-6	Zinc	153.	

000876

Sample Identification

BLANK

Matrix: Soil
pH:
Units: MG/KG
Dilution Factor: 1
Analysis Method: SW6010B
Delivery Group: 103948
Instrument: TRACE
Mercury DilFact: 1
Mercury Method: SW7141
Instrument: PS-200

Lab Sample ID: BLANK
Date Sampled:
Date Received:
Analysis Date: 6/24/98
Analysis Time: 8:53
Sample QC Group: 6495

Mercury Date: 6/24/98
Mercury Time: 23:20
Mercury QC Group: 6522

FORM I

CAS NUMBER	ANALYTE	CONCENTRATION		FLAG
7429-90-5	Aluminum	50.0	....	U
7440-36-0	Antimony	40.0	....	U
7440-38-2	Arsenic	60.0	....	U
7440-39-3	Barium	2.00	....	U
7440-41-7	Beryllium	0.30	....	U
7440-43-9	Cadmium	4.00	....	U
7440-47-3	Chromium	7.00	....	U
7440-48-4	Cobalt	7.00	....	U
7440-50-8	Copper	6.00	....	U
7439-92-1	Lead	50.0	....	U
7439-96-5	Manganese	2.00	....	U
7439-97-6	Mercury	0.10	....	U
7439-98-7	Molybdenum	8.00	....	U
7440-02-0	Nickel	15.0	....	U
7782-49-2	Selenium	80.0	....	U
7440-22-4	Silver	7.00	....	U
7440-28-0	Thallium	40.0	....	U
7440-62-2	Vanadium	8.00	....	U
7440-66-6	Zinc	2.00	....	U